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NEUROLOGICAL MANIFESTATIONS OF HYPOGLYCEMIA*

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INTRODUCTION. The increasing use of insulin gives great importance to certain embarrassing complications which it causes. Its benefits are so well recognized that unhesitatingly one can say that in spite of certain defects it is a most useful substance which probably will continue to be of increasing value for some time to come. Although many doctors see and treat with insulin only a few diabetics, so many diabetics in the larger clinics are given insulin that almost any physician may be called to see one during an emergency. It is obviously essential to recognize whether the patient has had too little or too much insulin or has some irrelevant condition. Adequate familiarity with diabetic coma and with the symptoms of hypoglycemia and knowledge of the means of detecting or excluding the presence of such will be of great value in such cases as well as in the cases of spontaneous hyperinsulinism such as those first published by Harris in 1924. Coma has been described fully and frequently elsewhere but the toxic effects of insulin seem less well known. Therefore in this paper the discussion will be limited to the deleterious effects of insulin, especially the neurological manifestations which are often so dramatic and perplexing.

Mechanism. The actual mechanism of the production of insulin reactions is not completely known. Usually the reactions are associated with hypoglycemia, although John (1927) and others maintain that a normal or increased blood sugar content may be present. In this clinic we have never recognized a severe insulin reaction in any patient whose blood sugar, when determined, was not subnormal. We have not infrequently seen patients with hypoglycemia who had no apparent symptoms. Case No. 11222 had a blood sugar of 0.02 per cent and no obvious symptoms, although on other occasions she had marked symptoms with higher, although subnormal, values.

Hypoglycemic Symptoms in Patients not Treated with Insulin. The symptoms of hypoglycemia seem independent of the cause of the hypoglycemia, whether it be subsequent to the injection of insulin or dependent on other factors. Mann (1921) reported symptoms, including convulsions in hepatectomized dogs; and in 1922 he showed that certain of these symptoms were associated with hypoglycemia and that the intravenous injection of sugar was followed by immediate and marked improvement. Harris in 1932 reviewed the reported cases of hyper- and dys-insulinism. The symptoms observed were similar to those seen in patients treated with insulin. Derick lists faintness, weakness, dizziness, hunger, tremor, sweating, vomiting, restlessness, amnesia, emotional outbursts, grimacing, salivation, numbness of head region, convulsions, coma, diplopia, urinary and fecal incontinence, speech defect, and residual paresis of left arm and leg for several hours among the symptoms. Hartmann (1929), Griffith (1929), Carr (1931), Weil (1932), and McGovern (1932) described some of these symptoms in their cases of spontaneous hypoglycemia.

For treatment Harris (1932) advised dietary regulation, including frequent feedings, and in obstinate cases partial pancreatectomy if the circumstances warranted it. Harris et al. (1932) observed one patient who obtained relief by pancreatectomy. Such also occurred in the case reported by Finney and Finney (1928). The cases* of hypoglycemia due to pancreatic neoplasm suffered from similar symptoms. Some of these cases had typical epileptic attacks, and in some cases complete relief followed partial pancreatectomy.

Symptoms of Insulin Hypoglycemia. The usual symptoms of hypoglycemia following the injection of insulin have often been described and seem to be much more widely recognized than certain less frequent neurological manifestations to be emphasized in this paper. Joslin (1928) describes fully the symptoms observed in a large number of cases, and these are similar to the ones listed by Derick in discussing spontaneous hypoglycemia. Among the symptoms of insulin reactions mentioned by Harrop (1927) are diminution of position sense, nystagmus, Cheyne-Stokes breathing, staggering gait, visual defect, tinnitus, mental sluggishness, delusions, and hallucinations. Labbé (1931) speaks of the abolition of reflexes, positive Babinski, amblyo-

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*Wilder et al. (1927); Thalhimer and Murphy (1928); McClenahan and Norris (1929); Nadler and Wolfer (1929); Howland et al. (1929); Crawford (1931); Carr et al. (1931); Womack Gnagi, and Graham (1931); Derick, Newton et al. (1933).

pia, melancholia, and epileptiform seizures. Certain symptoms that have occurred in our cases seem worthy of mention. Unwarranted irritability, palpitation, hot flashes, tinnitus, paresthesia, fixed stare, nausea and vomiting, dilated pupils, headache, blindness, hysteria, inability to speak, Cheyne-Stokes breathing, thrashing movements, epileptiform convulsions, loss of sphincteric control, and paralyses have all occurred. The onset of the symptoms is brief, and occasionally without warning a patient may drop unconscious. The usual initial symptoms may be replaced by such odd ones as blindness, which occurred in cases 8428 and 10205. Case No. 7038 has noticed that her reactions are preceded by Cheyne-Stokes breathing, which, however, may be associated with diabetic coma—Case No. 4655. Sometimes numbness in the circumoral region denotes a low blood sugar. Unusual irritability or quietness in a child may be of the same significance. At times the patients are quiet and flaccid, at others delirious and violent. The duration of the symptoms depends in great part on the handling of the case after the onset of symptoms. Usually relief follows a few minutes after the administration of a quickly available carbohydrate and often even before an intravenous injection of glucose can be completed. However, there may be a marked temporary residuum such as occurred in a boy, Case No. 5330, who remained apathetic for more than forty-eight hours after his blood sugar had risen to normal, and even during the reaction more than 25 Gm. of carbohydrate by vein and mouth were required to raise his blood sugar to a normal level.

Unusual Psychic and Mental Symptoms. One of the most interesting and striking cases of hypoglycemia with mental symptoms was that of Wilder*. This diabetic child, treated with insulin, did well in all classes at school save one. After several months it was noted that this subject was taught in the late forenoon, at the time that hypoglycemia was most likely to occur. A light carbohydrate lunch before this hour immediately improved the child's grade in this subject. Sevringhaus (1926) reported in insulin-treated diabetics mental sluggishness and amnesia occurring for months almost daily at the time hypoglycemia might reasonably be expected. Absence of the usual symptoms of hypoglycemia prevented an earlier recognition by the patient of the etiological agent. Not infrequently these long-standing cases may have as manifestations of hypoglycemia only such unusual symptoms as to simulate another disease. Dr. M. L. Townsend in a letter to Dr. Elliott P. Joslin mentions diabetics diagnosed as psychopathic because of recurring psychic and mental upsets over long periods. The cerebral disturbance in these cases was severe and associated with marked phobia. Reduction of the insulin dosage caused a disappearance of the symptoms. One of the cases had had no recurrence of the psychiatric phenomena at the time Dr. Townsend's letter was written, more than four and a half years after the alteration of the insulin dosage. Epilepsy is another condition simulated by insulin reactions. Wladyczko (1925) stated that hypoglycemia was at times the causative agent in epilepsy, and for this he recommended "the sugar cure" with or without glandular therapy. Nielsen and Eggleston (1930) also reported cases of epilepsy which apparently were due to hypoglycemia and these were relieved by dietary regulation. Harris (1932) observed three epileptics with associated hypoglycemia with improvement when the prescribed diet was followed. In our own experience it has at times been difficult to decide whether certain patients have had true idiopathic epilepsy or merely recurring hypoglycemic convulsions. Some cases sent to us with a diagnosis of epilepsy have merely had hypoglycemic convulsions due to an imbalance between diet, exercise and insulin; and in some cases we have not known definitely whether the attacks were of epileptic or hypoglycemic origin. This subject is discussed more fully in a paper by the writer as yet unpublished, but accepted by the *Archives of Internal Medicine.* One other queer psychic symptom has been reported by Foster (1930), and this also occurred in our patient, Case No. 3727. Foster's patient had an uncontrollable desire to exert himself and to break things to pieces. Our patient tore her clothes and broke one of her most cherished toilet articles. Carbohydrate administered by her family gave relief within a short time.

Insulin Paralysis. One of the rarer effects of insulin is the causation of paralysis, other than the loss of sphincter control such as not infrequently occurs in hypoglycemic convulsions. Stone (1926) mentions one case of paralysis attributed to hypoglycemia. Miller and Trescher (1927) described a case of insulin hypoglycemia with convulsions and hemiparesis. Ravid (1928) reported such a case with three attacks of hypoglycemic hemiplegia. This patient, though only 34 years old and a diabetic of only five years' duration, had retinitis. Reinwein (1931) reported a case of transient hypoglycemic paralysis of one arm and one side of the face. Traut (1931) also noted residual apraxia and weakness of one arm in a patient suffering presumably from hypoglycemia. Crisciello and Messer (1931) had a patient with recurring hemiplegia of hypoglycemia origin, and relief followed regulation of the insulin and dietary régime. Joslin (1928) refers to the reported cases and adds some of his own. The

*Personal communication.

finding of a positive Babinski reflex during hypoglycemia has been reported by Emmons (1924), Pemberton (1925), Hart and Bond (1929), Labbé (1931), and Anderson (1931) in addition to that found in certain of the cases with insulin paralysis. The following brief review of the cases reported by Joslin (1928) is given along with a presentation of the additional ones seen since then.

CASE A. F.* had repeated hemiplegia associated with hypoglycemia. Each time quickly available carbohydrate gave relief within twenty minutes or less. For the past four years she has so regulated her diabetes that she has had continuous glycosuria and no hypoglycemic attacks.

CASE No. 2856, a boy 14 years old with diabetes of four years' duration. No arteriosclerosis. Blood pressure 90/50. At home he had a severe insulin reaction and a sugar-free urine, during which time he had three or four convulsions followed by paralysis of one arm lasting not more than a few days. No residual disturbance.

CASE No. 4697, a woman 43 years old with diabetes of five years' duration. Blood pressure 112/80. Old hemorrhage in left optic fundus. On the day that the patient became sugar-free during the treatment of her diabetes there was a gradual onset of paralysis of the left arm and leg associated with edema of the face. She was much improved within three weeks, although wrist drop was still present. Five months later there was still a slight residuum from the paralysis.

CASE No. 4115, a woman 53 years old with diabetes of two years' duration. Slight arteriosclerosis. Blood pressure 170/90. She was admitted in severe diabetic acidosis. Hypoglycemia resulted from the diabetic treatment, and was followed by hemiplegia which disappeared within three days.

CASES SEEN SINCE 1928

CASE No. 2052, a man 29 years old with diabetes of 11.8 years' duration. Moderate arteriosclerosis of the radial arteries but none in the eye-grounds or in the legs (by x-ray). Blood pressure 110/82. He was subject to severe insulin reactions. On three occasions they were associated with marked generalized paresis, especially of the right side. It required 30 to 40 minutes for him to move twelve inches in bed to ring a bell for help. Within 20 to 40 minutes after drinking fruit juice, he regained full use of his muscles but remained mentally sluggish for three hours more and somewhat exhausted and apathetic for twenty-four hours.

CASE No. 3727, a woman 32 years old with diabetes of 8 years' duration. Mild arteriosclerosis. Blood pressure 100/60. Accustomed to reactions at bed time, at which time this episode occurred. She suddenly became confused and fell unconscious to the floor. There was frothing at the mouth, but no convulsion. Consciousness returned within a few minutes, and she then noticed paralysis of the left arm. At the hospital the following morning she complained of paralysis of the left arm and paresthesia of the thumb. The urine was free from sugar. Movements of the fingers and thumb seemed normal. Flexion at the wrist and adduction of the humerus also apparently were normal. All other movements were weak, some more than others. The radial and biceps reflexes were normal on the right, but absent on the left. The triceps reflexes were normal on both sides. By percussion the left diaphragm seemed high. Improvement was noted within twelve hours and was complete within two weeks.

*This case of Dr. F. Gorham Brigham of Boston is used with his kind permission.

Occasional Serious Effects of Insulin. Even a simple insulin reaction may at times cause a calamity out of all proportion to the actual effects of the insulin reactions. Slight mental confusion at a critical time when one is driving an automobile may lead to a fatal accident. A little dizziness or weakness in a man laying a roof may cause his death. Such coincidences cannot be ignored. But there are other effects attributed directly to the effect of insulin. Wohlwill (1928) noted cerebral pathology in man and in animals which he attributed to insulin hypoglycemia. Priesel and Wagner in 1925 called attention to the cardiac irregularity occurring in hypoglycemia resulting from the insulin treatment of diabetic coma, and Duncan and Polk (1930) also noted such irregularity during hypoglycemia. The reports by Blotner (1930), Root and Graybiel (1931), and Parsonnet and Hyman (1931) indicate that severe cardiac trouble may be caused by hypoglycemia. Ehrmann and Jacoby (1924) observed hemorrhage in two cases of diabetic coma treated with insulin; but the acidosis may well have been the inciting agent, since hemorrhage into the gastro-intestinal tract is frequently seen in coma before treatment is begun. However, Güdemann (1926) reported a diabetic and tuberculous patient who had hematuria following each injection of insulin, and Henderson (1927) and Neale (1928) have made somewhat similar observations. Alperin (1929) and McBean (1929) have reported retinal detachment following insulin therapy. In the above reports there was stated no definite evidence for hypoglycemia as the cause of the bleeding or retinal detachment. The case of hypoglycemia published by Pemberton (1925) was fatal. Autopsy showed "wet" brain. Heimann-Trosien and Hirsch-Kauffmann (1926) reported prolonged and fatal hypoglycemia in a diabetic girl of 8 years. Leyton (1926) also reported two deaths with no known cause other than hypoglycemia. Sevringhaus' (1926) case of hypoglycemia with vomiting died from a bronchopneumonia resulting from the aspiration of the vomitus. Root (1926) described a fatal case of hypoglycemia, and White (1932) also reported fatalities attributed to hypoglycemia. In view of such increasing evidence it is reasonable to study carefully each patient receiving insulin so that insulin reactions may be prevented in so far as is possible.

Potentially Hypoglycemic Patients. Some patients seem much more prone to insulin reactions than others, and in some cases this seems to be dependent purely on individual idiosyncrasy. Nevertheless there are certain types and certain conditions apparently predisposing to hypoglycemia. In general young people are apt to have reactions more often than the older patients. Severe diabetics and those poorly nourished and dehydrated should be watched closely. Exercise often brings on hypoglycemia, and proper consideration must be taken of this. Interference with the intake or absorption of food such as occurs in careless patients or those suffering from nausea or diarrhea may lead to hypoglycemia. As a rule food should be taken shortly after the administration of insulin. One needs a store of glycogen to maintain a normal blood sugar level, and too great restriction of the diet often results in an insulin reaction. Patients first coming under treatment often improve so that the proper insulin dosage may later become excessive. Witness the case of insulin paralysis reported by Criscitiello and Messer (1931). This is even more true of septic patients in whom the infection later disappears. Such cases often require large doses of insulin at first and none later on as the condition improves. Coma similarly demands vigorous treatment which soon must be discontinued. Leyton (1926) states that histamine will lower the blood sugar; and it behooves us to remember this in performing gastric analyses in conjunction with the injection of histamine.

Treatment. The treatment for insulin reactions is more than just the administration of carbohydrate or adrenalin. It involves a study of the case to determine the cause of the reaction and the best way to prevent subsequent attacks. Ordinarily during an attack, relief quickly follows the ingestion of orange juice or sugar solution, but at times intravenous glucose or adrenalin may be needed. One must be careful that the substance given orally is not aspirated. After the attack has been controlled, one must give thought to the prevention of subsequent attacks. This is especially important in sclerotic and hypertensive individuals. An attack of coronary thrombosis or apoplexy due to hypoglycemia is neither easily remedied nor easily explained to the family. Extra care is needed for the prevention of reactions in individuals engaged in such activities as swimming or diving, as driving an automobile or public conveyance, and as working in precarious positions in the construction of buildings or bridges. Sometimes a reputation must be protected; for it is not seemly for a clergyman to appear intoxicated, and gossip lives on a frugal diet. Exercise must often be compensated for by a reduction of the preceding or subsequent dose of insulin or by the addition of a light lunch at the proper time. Small and more frequent doses of insulin are better tolerated than one or two very large doses. One must not overlook the fact that rapidly changing conditions may require radical alteration of the diabetic régime. As for the hemorrhages, our knowledge of them is too meager to be of service, but it might be well to try a different kind of insulin in the hope that the hemorrhage was merely an anaphylactic phenomenon, since we frequently see local anaphylaxis at the site of injected insulin, and Basch (1929) has shown that in certain allergic conditions there is increased capillary permeability.

Summary. This paper is written to draw attention to many unusual symptoms of hypoglycemia, such as the insulin paralyses, and to point out again the harmful results which may occur when adequate care is not given to prevent insulin reactions.

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THE ACCURACY OF DEATH CERTIFICATE DIAGNOSES IN CASES OF BUCCAL CARCINOMA*

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IN the end result study of carcinoma of the lip and buccal mucosa that has recently been completed for the years 1918-1926 at the Collis P. Huntington Memorial Hospital, the cause of death given on the certificate was frequently obtained from official sources. It was noticed that commonly this diagnosis differed from that made by the hospital staff after examination. The differences noted were of such kinds and frequency that a study of them is warranted in order to determine to what extent studies made on the basis of death certificate data may be compared with studies based on clinical and pathological data. Such a study has never been published on a large series of cases of buccal carcinoma.

METHOD OF STUDY

Two hundred and eighty cases were studied. They were all examined and treated in the clinic during the years 1918-1921. The deaths occurred from 1918 to 1930 with the median year of death 1921. The hospital diagnoses were based on clear-cut clinical evidence in all cases with additional pathological proof in eighty-two. All instances in which there was any possibility of the patient being cured of cancer were excluded. None of the cases died in the Huntington Memorial Hospital, but many died in some other institution. The cases are divided into the groups shown in Table 1.

*From the Cancer Commission of Harvard University. Aid was given by an anonymous donor.

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DESCRIPTION OF NATURE OF TUMOR

From Table 1, Group 1, it is seen that there were only two instances where the diagnosis of cancer was entirely left out of the death certificate. This is really remarkably accurate reporting. The two death certificates in question reported the deaths as "maxillary sinusitis" in a case of carcinoma of the upper jaw, and as "Found dead in bed" in a case of carcinoma of the floor of the mouth. The latter certificate was signed by a board of health physician.

TABLE 1

CARCINOMA OF BUCCAL CAVITY

DEATH CERTIFICATE DIAGNOSES

	Number of Cases
1. Fact that patient had Cancer not mentioned	2
2. Nature of Tumor	
A—Carcinoma	173
B—Cancer	87
C—Mixed Tumor	1
D—Sarcoma	17
Total	278
3. Location of Primary Tumor	
A—Agreement with Hospital Diagnosis	137
B—Other Buccal Diagnosis	54
C—Diagnosis Outside Buccal Cavity	87
Total	278

Group 2 in the same table shows that 17, or six per cent, are listed as sarcoma. (In most

cases sarcoma of the jaw.) Inquiry has been made of the physicians signing the certificates of all 17 of these cases as to the evidence that led to the diagnosis of sarcoma. In no case was this diagnosis based on pathological proof. Unfortunately, pathological proof of the hospital diagnosis of carcinoma is available in only two of the 17. The others, however, were all apparently definite cases of buccal carcinoma. Sarcoma of the jaw is a very rare disease unless cases of epulis are so classified. Although the classification of six per cent of carcinoma as sarcoma makes a slight but relatively unimportant reduction in the number of cases of carcinoma reported, it must make a very appreciable apparent increase in the number of cases of buccal sarcoma over the number that actually occur.

The single case of mixed tumor is statistically unimportant.

The 87 cases described as cancer, a term often employed to cover any form of malignant disease, are important only in that it is a less valuable diagnosis than the more exact one of carcinoma.

DESCRIPTION OF LOCATION OF TUMOR

In the description of location there are important differences in agreement in the different parts of the mouth. These are shown in Table 2.

TABLE 2

CARCINOMA OF BUCCAL CAVITY

LOCATION OF PRIMARY TUMOR ACCORDING TO DEATH CERTIFICATE

Location According to Hospital	A Agrees Exactly	B Other Part of Mouth	C Outside Mouth	Total
Lip	23	7	11	41
Tongue	60	8	29	97
Floor	13	14	2	29
Cheek	4	8	8	20
Upper Jaw	7	1	5	13
Lower Jaw	15	7	8	30
Palate	4	2	7	13
Tonsil	11	7	17	35
Total	137	54	87	278
Per cent	49	19	31	

NOTE: In constructing this table, death certificate diagnosis of carcinoma of the tongue was considered to agree when hospital diagnosis was floor of mouth.

Exact agreement as to the original site of a primary buccal cancer cannot always be reached by two observers because many cases develop in such a way as to obscure the point of origin. This is true even if the two observers see the lesion at the same time. A later observer always has a more difficult decision than an earlier one. For this reason death certificate diagnoses in Class B cannot be considered serious errors, and at the present stage of development of the statistical study of cancer are relatively unimportant.

The cases in which the locations given disagree but both remain within the mouth (Group 3B of Table 1) are shown in Table 3.

TABLE 3

CARCINOMA OF BUCCAL CAVITY

SITE OF PRIMARY TUMOR AS GIVEN ON DEATH CERTIFICATE COMPARED WITH HOSPITAL RECORD

Hospital Location	Death Certificate Location: Lip	Tongue	Floor	Cheek	U. Jaw	L. Jaw	Palate	Tonsil	Total
Lip		0	0	1	0	5	0	0	6
Tongue	2		0	0	0	6	0	0	8
Floor	2	0		0	0	8	0	0	10
Cheek	0	0	0		2	5	0	0	7
U. Jaw	0	1	0	0		0	0	0	1
L. Jaw	2	1	1	0	1		0	0	5
Palate	0	0	0	0	0	1		1	2
Tonsil	0	2	0	1	2	1	0		6
Total	6	4	1	2	5	26	0	1	45

NOTE: This table contains only those cases in which the death certificate diagnosis and hospital diagnosis both placed the tumor in some definite part of the mouth.

The shift from all the different clinical diagnoses toward the diagnosis of tumor of lower jaw is the most striking fact shown by this table. This point will be discussed later.

The more important differences are in those in which no mention of buccal origin was made on the death certificate (Class 3C, Table 1). These arise from three causes: first, the reporting of disease in adjacent lymph nodes as if it were the primary disease; secondly, the reporting of disease as primary in some region

TABLE 4

CARCINOMA OF BUCCAL CAVITY

DEATH CERTIFICATE STATING POINT OF ORIGIN ELSEWHERE

	Death Certificate Description	Number of Cases
1. Lymph node involvement reported as primary	Neck	14
	Throat	30
	Total	44
2. Location given of point involved by extension outside buccal cavity	Face	29
	Pharynx	5
	Larynx	5
	Esophagus	1
	Glottis	1
	Total	41
3. Location given of point involved by distant metastasis	Cerebrum	1

that is involved by direct extension; and, thirdly, the reporting of disease as primary in some region involved by metastases. In the present group this occurred in 86 of the 283 cases giving an error of 31 per cent. The different locations stated as being the primary site of the carcinoma are shown in Table 4.

It will be noted that the errors are nearly equally divided between areas of glandular disease and areas of direct extension considered to be the primary location. Distant metastases are unimportant, probably because they seldom occur in this type of carcinoma.

In the statistics presented in the United States Census reports, the figures for buccal cavity cancer do not go into great detail but subdivide the cases into four groups: lip, tongue, jaw and other buccal. In the report for the year 1921[2], there were recorded from the whole census registration area 2610 deaths from buccal cavity cancer. The division into four groups of these cases is shown on Table 5.

TABLE 5

U. S. BUREAU OF CENSUS—1921 MORTALITY STATISTICS

DEATHS FROM BUCCAL CANCER

	Number of Cases	Per Cent
Lip	432	16.5
Tongue	653	25.
Jaw	979	37.5
Other	546	21.0
Total	2610	100.

Table 5 shows that cancer of the jaw was reported as the most frequent cause of death.

DISCUSSION

Compilations of data from death records have been used in many studies to show the relative frequency of cancer of different organs as causes of death and to show variations in the death rates from these causes. Such studies are hampered by indefinite or erroneous diagnoses and municipal and state authorities are gradually becoming more strict in respect to what is considered a satisfactory death report. Cancer of the throat is, for instance, such an indefinite report. In the first place carcinoma, sarcoma, or mixed tumor, as the case may be, should be distinguished if possible. Secondly, there are many kinds of cancer that may involve the throat in addition to those of the buccal mucosa. A few of the more common ones are those of the thyroid, larnyx, esophagus and skin of the neck. There is also the much less common primary carcinoma of the neck arising in a branchial rest.

Buccal carcinoma in the male is one of the more common varieties of cancer and makes up about seven per cent of male cancer deaths reported. If the figures in this study represent conditions generally, about one-third of the cases originating in the mouth are ascribed to other regions. Unless there is a counterbalancing error in the ascribing of extra-buccal growths to balance this shift, the published figures are erroneously low. It is probable that certain skin cancers, especially those of the upper lip, may be ascribed at times to the buccal mucosa, but the magnitude of this or other similar errors is not known and cannot be studied from the data at hand. Is it possible, that because of the ascribing of many buccal cases to the face (therefore to the skin) the latter is really a much less frequent cause of death than present figures indicate? Similar official reports indicate cancer of the neck as a rather frequent cause of death, nearly comparable in numbers to cancer of the buccal cavity. Actually, are not these cases, to a large extent, probably a mixture of buccal, larynx and thyroid carcinomas?

One might ask whether the primary focus of disease should be mentioned on the certificate when it has been successfully removed but recurrence has taken place in adjacent lymph nodes. The answer is, "Yes". A death report in such a case should state, for instance:

> Primary Cause of Death—"Carcinoma of the Lip with Metastases to the Neck."
> Secondary—"Broncho-pneumonia."

However, if a patient has been completely cured of cancer for a period of years and dies without signs of local or distant recurrence, the fact that the patient had ever had cancer should not be mentioned on the certificate.

SUMMARY

1. The clinical diagnosis and the death certificate diagnosis have been compared in 280 patients that have had buccal carcinoma.

2. The death certificates show truly remarkably accurate data so far as the diagnosis of cancer is concerned, with less than one per cent of such errors.

3. The indefinite term cancer was used in 32 per cent of the certificates.

4. Six per cent of cases were certified as sarcoma when the clinical diagnosis was carcinoma.

5. The location of the tumor was given in agreement with the clinical diagnosis in 49 per cent, in another part of the buccal cavity in 16 per cent, in the mouth without specifying the exact part in three per cent, and outside of the mouth in 31 per cent of the cases.

6. In the cases where the death certificate placed the cancer in the mouth, but not the same part of the mouth that the clinical record placed it, there was a striking tendency to locate the lesion in the lower jaw.

7. To make death records and statistics derived from them of greater value, the record must always, when possible, specify the type

of growth and the true location of the primary lesion.

The authors wish to thank Miss Hilda M. Holton and Miss Lillian Sullivan for their assistance in this work.

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BACKACHE*

BY JOEL E. GOLDTHWAIT, M.D.†

SINCE backache is probably the most common symptom for which medical relief is sought, and since it is associated with many different conditions or diseases, it is necessary, with the time at our disposal, to limit the discussion to one aspect of the subject. Spinal tuberculosis, or osteomyelitis, or the various arthritides as they affect the spine are purposely not mentioned, but the discussion is confined to the conditions in which the symptoms are due chiefly to the wrong use of the part, or faulty mechanics, the symptoms being due to strain with chronic weakness of the parts. Since this represents probably at least 90 per cent of the "backache" cases, the total number of the cases not represented in our discussion is not large, and when it is recognized that with the arthritic cases a strong primary factor is the faulty mechanics, this percentage of the cases omitted is still further reduced.

Starting with this understanding in interpreting the symptoms, it should be recognized that while muscle strains or fascial tears do occur, they nevertheless are very rare and are usually easily recognized so that our chief problem has to do with the mechanics of the joints of the spine.

With such a problem, in order to understand the symptoms and to intelligently apply treatment, it is essential that the basic anatomy be understood, with the function that is to be expected in a given case once the special structure is known.

Since no two persons are made alike, it is essential that we be able to recognize the peculiarities and intelligently estimate the function of the part with such peculiarity.

In order to appreciate this it is necessary to briefly review the anatomy of the spine and the mechanism of its use. The spine is, of course, usually made up of twenty-four individual bones held together by ligaments and controlled for function by muscles, but the number of the vertebrae, however, is not constant, each region, the cervical, the dorsal, and the lumbar portions, showing at times less or more vertebrae than is considered normal.

The individual vertebra is made up of two articular processes which are on opposite sides and back of the opening through which the spinal cord passes, and these articulate with similar processes of the vertebra above or below. These articulations are true joints, and represent the only truly joint mechanism in the spine. The joints of the two sides do not connect, each joint being distinct and independent.

Apart from these, each vertebra has four processes which project forward, backward, and to each side. These are placed around the firm ring which makes the spinal canal. The anterior process is larger than the others and is designed to carry the weight of the body when it is used erect. In order that the weight may be carried easily, between each of these anterior processes or bodies of the vertebrae, is placed a mass of elastic fibrocartilage which is held in place by a firm ligament which entirely surrounds this mass and is itself attached to the upper and lower outer surfaces of the vertebral body. In this mechanism there is yielding in movement of the body but no true motion in the part itself so that this is not the joint of the spine. At the back is the so-called spinous process to which are attached ligaments and muscles, while between these processes is a dense mass of ligament which serves to lessen the jar if the processes are crowded together in backward bending, the same as the intervertebral discs lessen the jar in forward bending.

At the sides are the transverse processes, one upon each side, to which are attached ligaments and muscles, while in the dorsal region they receive part of the attachment of the ribs. Each of these four processes serves to steady and control the movements made in the spine but it must always be remembered that the joint mechanism has to do entirely with the articular processes so that as the spinal joints are mentioned hereafter in this paper, it will always, unless specially mentioned, refer to the articular process mechanism.

To still further understand the problem, it must be remembered that the articular processes in the lumbar region are supposed, according to the textbooks, to be crescentic in shape with the general axis vertical (fig. 1). In the dorsal region the processes are flat, the plane of the joint being transverse, with a slight inclination forward, from the perpendicular in the upper part. In the cervical region the processes are flat with the plane transverse and the inclination of the upper part is forward.

This is as the spine is described in the textbooks, but there are many variations from this.

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With the slender, flexible individual, which apparently represents fully half of the human family today, the processes in the lumbar region

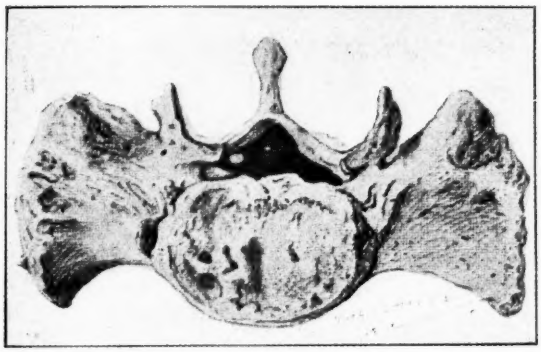


FIG. 1. Top of sacrum shows the crescentic articular processes into which processes of the last lumbar vertebra fit. The typical textbook type of articular process for the entire lumbar region.

are usually flat with the plane of the joint transverse (fig. 2), this making freedom of motion that would not be possible with the crescentic type of process. Not only this but the processes, whether flat or crescentic, vary in length as

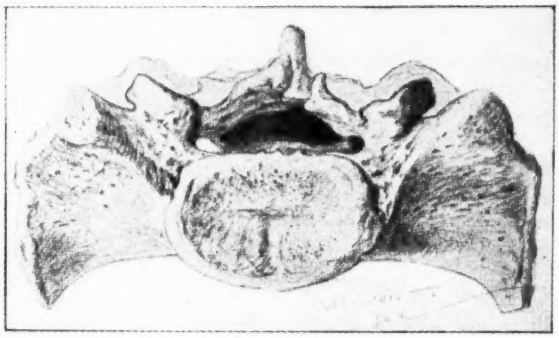


FIG. 2. The type of sacrum showing the flat articular processes.

well as inclination, with definite effect upon the range of motion. A crescentic process may be very long and so securely mortise the vertebrae as to render only very slight lateral motion possible, also the axis may be oblique, the two processes inclining inward at the bottom (fig. 3) thus limiting backward bending especially. The flat articulations may also have been bent forward in childhood with resulting peculiarity of the mechanics.

Still another variation is with a crescentic articulation upon one side, with a flat one on the other (fig. 4), allowing greater freedom of bending in one direction than the other while another feature that must be appreciated is that the articular processes of the top of the sacrum are not always fixed and have no bony connection with the sacrum, the bones being held in place under such conditions entirely by the muscles and ligaments. This naturally makes a weak joint easily capable of strain.

With the lumbar spine, a peculiarity that is fairly common consists in the transverse processes of the last lumbar vertebra being much larger than normal, with many times a true joint formed between the end of this process and the top of the sacrum, the "lumbosacral transverse

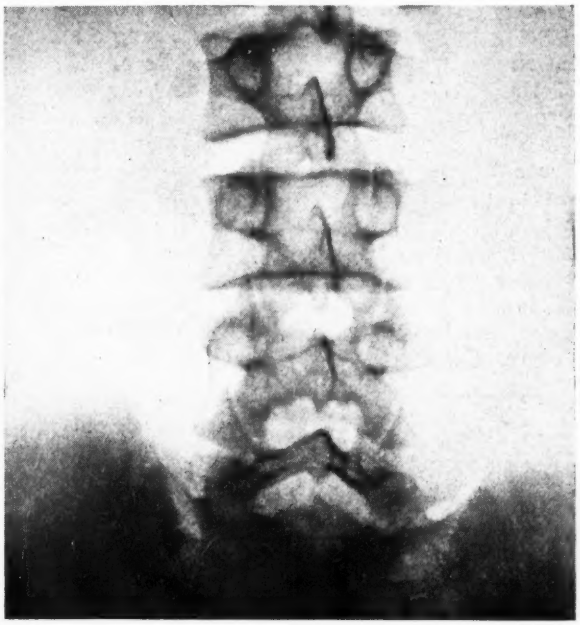


FIG. 3. The crescentic type of articular processes but with the axis inclined downward and inward on both sides, naturally limiting motion, especially backward bending.

joint". At times this formation is upon both sides which makes the joint at this level less flexible but more secure than is normal, while at other times it is only upon one side, and allows peculiarities of motion, with possibility of strain that would be greater than normal.

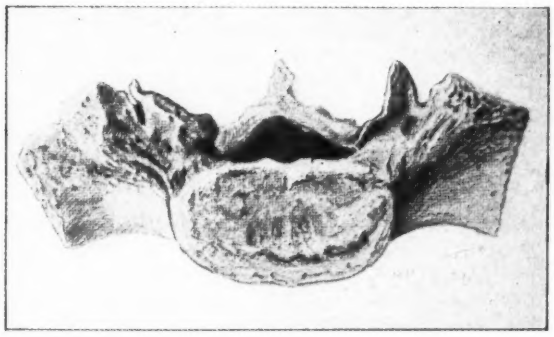


FIG. 4. The top of the sacrum showing a crescentic articular process upon one side with a flat articular process upon the other. This variation may be shown in any part of the lumbar region.

At the dorsolumbar region where the usual crescentic articulations of the lumbar region change to the flat overlapping ones of the dorsal, there are also many variations, which influence the motion of this part as well as the possibility of strain.

Beginning at this region and extending upward through the dorsal or thoracic region is another series of joints as the ribs have their attachment to the spine. These costovertebral joints are true joints, with definite motion that is different at the different levels and the back symptoms in this dorsal region have to do largely with these costovertebral joints. For the two lower or "floating ribs" there is a single articulation and that at about the middle of the side of the vertebra. For the ribs above, there are two separate articulations, one for the head of the ribs which articulates partly with the vertebra above, and partly with the vertebra below, the middle portion of the head of the rib resting upon the intervertebral cartilage. Besides this joint there is another where the rib rests against the transverse process, but the location of this joint is not constant, sometimes being upon the anterior surface of the transverse process (fig. 5A) and at other times upon the

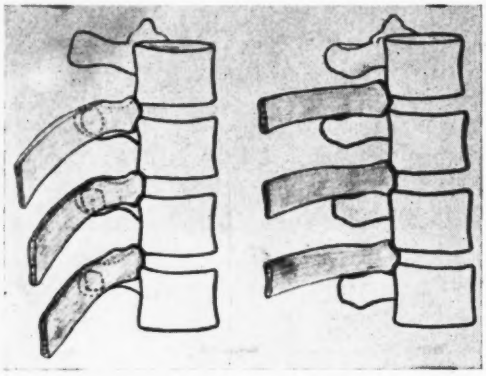


FIG. 5.

FIG. 5A. Sketch showing the articulation of the rib with the spine with the articulation at the tip of the transverse process on the anterior surface.

FIG. 5B. A sketch showing the fairly common arrangement of the rib with the articulation at the angle of the rib on the top of the transverse process. The possible leverage in the sagging of the rib upon the head of the bone is obvious.

upper surface of the process (fig. 5B). The range of motion in these joints is not great but is enough to allow for the usual thoracic part of respiration.

In the cervical region the anterior process or body is smaller than with the vertebrae below, and the surface of the bones is not flat but curves downward, thus lessening possible side slipping. In this region the transverse processes are shorter than with the vertebrae below but are broader in the horizontal plane and through this the vertebral artery passes. The spinous processes in this region usually extend straight backward (fig. 6), on about the same level as the bodies of the vertebrae, but at times they incline downward, making nearly a right angle with the long axis of the body of the bone (fig. 7), similar to the spinous processes of the middorsal region.

In very brief, this is the structure of the spinal column, but all of the portions are liable to variation and the characteristics of each section, lumbar, dorsal, and cervical, are less pronounced as the different sections join each other. It is because of this structure that makes the lumbosacral, the dorsolumbar, the cervicodorsal and the occipitocervical regions, the regions of great-

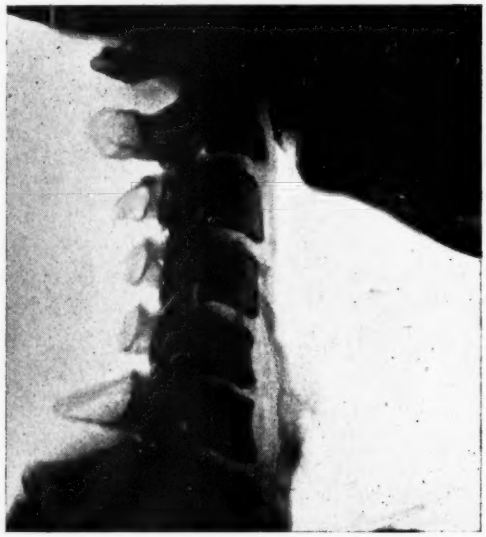


FIG. 6. Cervical spine showing the spinous processes extending straight backward practically in the line of the main axis of the body of the bone. Free motions should be expected under these conditions.

FIG. 7. A cervical spine with the spinous processes inclined downward at nearly a right angle with the main axis of the body of the vertebra. Naturally motion, especially backward bending, must be much limited under such conditions with easy possibility of strain.

est mobility, a part that should be borne in mind in interpreting symptoms.

Besides this, the base upon which the spine rests, and closely related to it in its development and function, is the pelvis. The sacrum as it joins the spine is similar in its structure to the vertebrae and the lumbosacral joint is a very im-

portant one in the body use. Not only this but the pelvis is made up of three bones with three joints at their points of contact, these joints having either a vertical plane (the symphysis) or oblique, nearer the vertical than the horizontal (the sacro-iliac) and are naturally quite unstable so that strains are easy. Since the pelvis is the structural base of the body, all of the trunk muscles as well as all of the thigh muscles being attached to it, if the base is weakened the supporting muscles of the body must work less well, with possible difficulty with the spinal mechanism above as well as the pelvic joints themselves.

Pain in the back, or backache, in the first place almost always represents trouble with the structures of the spine, and is rarely ever due to disturbances with the viscera. The pain may be due to strain or injury of any of the spinal structures, but since most of the cases represent joint strain primarily, the pain will usually be referred to very definite regions, the sacroiliac, the lumbosacral, the dorsolumbar, the middorsal, or costovertebral, and the cervicodorsal.

With the sacro-iliac the pain is usually referred to the sacral region, more on one side than the other, with commonly some pain referred to the leg extending usually down the back of the thigh to the calf. One side is usually more affected than the other but the other is commonly not entirely free. The pain which may be severe in the daytime is usually worse at night, and it is with this type of strain that control of the urine is often disturbed, this being more marked when lying down than when up and about. With this type of case, tenderness over the symphysis is frequent but the most common is over the sacroiliac joints. With women, because of the pelvic relaxation during menstruation, the pain is worse at those times.

With the lumbosacral joint strains, which are by far the most common cause of backache, the pain is usually referred to that region and more to one side than the other, and the tenderness is commonly over the articular processes or articulations. With this type of case the pain is usually worse when the patient is up and about, and is relieved when lying upon the back. Turning over after long periods of rest is usually hard and the urine control, which with these cases may be troublesome, is most noticeable when in the upright position, being much less when lying flat.

The motions of the spine in this type of case are usually limited in certain directions but free in others instead of the constant limitations as would be present with true disease, and the limitation of the straight leg raising in these cases is slight, while marked with the sacro-iliac lesions.

The dorso lumbar region is also a common seat of pain which is usually more upon one side than the other and it is here as well as with the joints above that the common referred pains extending around the body to the abdomen and chest wall are met. The pain at the dorso lumbar region is largely referred to the side of the spine over the articulation or more over the transverse process where the last rib is frequently lying in contact with the process (fig. 8) or is caught behind it. The pain in these

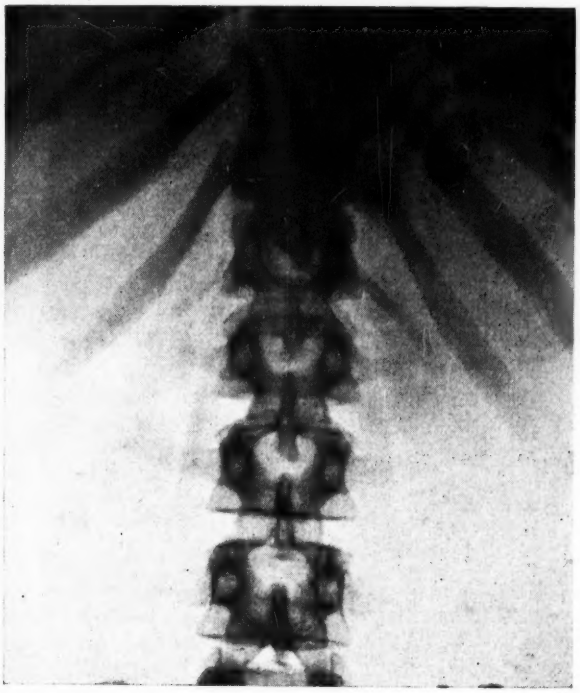


FIG. 8. The dorsolumbar region, showing rudimentary last ribs with the next rib above sagging downward. Pressure upon either the eleventh or the twelfth nerves is easily possible.

cases is largely due to the pressure upon the thoracic, or intercostal nerve, and makes the reference of the pain to the side and lower part of the abdomen understandable. For pain in this general region not only is the dorso lumbar joint involved, but the joint next above is often involved, at the same time and the distribution of the pain will depend, of course, upon which of the nerves, the eleventh or the twelfth, is the more irritated.

To understand the pain referred to this region, often called kidney pain, it is desirable to understand the variations in the anatomy commonly met. Not only do the articular processes vary but the transverse processes also, some being short and some long, while the ribs vary very much in their length and shape, as well as the size of the costovertebral joint.

With pain referred to this general region, while it is usually chiefly upon one side, the other side is often somewhat involved and is usually relieved when the patient is put in the knee-hand position, the ribs at such times sagging forward away from the tip of the transverse processes as well as correcting any twist or sag at the costovertebral joint which may have been present.

As one ascends from this point, the next region where pain is often met is about the middorsal region with one or two joints above or below the middle. In these cases the pain is generally referred to between the scapulae, and is usually upon one side and is apparently due to the strain or displacement of the costovertebral joints. The special symptom may be due to difficulty with either the articulation formed by the head of the rib with the spine, or the articulation at the angle of the rib with the tip of the transverse process. In either case, because of the location of the intercostal nerve or

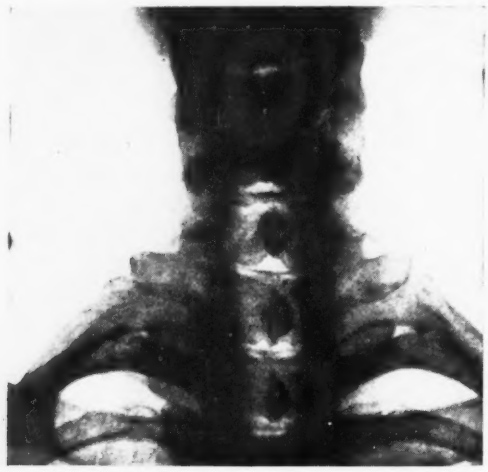


FIG. 9. The cervicodorsal region showing the transverse processes of the last cervical with a downward and outward inclination and with the transverse process of the first dorsal sloping upward as well as outward. The possibility of troublesome contact between the two must be obvious.

its root, the irritation of this with the common reference of the pain is to be expected.

It is this mechanism, together with that just described of the dorsolumbar that explains the symptoms of pseudo-abdominal disease as has been described by Dr. Carnett.

Above the middorsal region there is little complaint of pain until one reaches the cervicodorsal region, except occasionally where the tip of the upper part of the scapula rests upon the ribs. This usually occurs when the upper part of the scapula is flexed forward more than is normal, the pain being due to the rubbing of the tip of the scapula over the ribs and is only indirectly associated with the back pains.

At the cervicodorsal region the pain to be expected is referred to the tip of the spinous processes as they crowd together or more commonly over the transverse processes. To better understand the latter feature, it should be remembered that the transverse processes of the last cervical vertebra slope downward as well as outward while the transverse processes of the first dorsal extend upward as well as outward (fig. 9). Since these transverse processes are posterior to the center of the joint, if the spine in this region is held in extension, the transverse processes of these two vertebrae may easily be crowded together enough to produce pain or irritation. Since the nerve passes close to the point of contact, the referred pain to the arm is understandable.

Pain or ache referred to the midcervical region is fairly common and is referred to the spinous processes, the pain being due to the irritation from the crowding of the processes together when the body is sagged and the cervical spine used in complete extension.

This very briefly explains the location of the pains or aches commonly referred to the back, with the underlying anatomy.

To understand the symptoms and to intelligently plan the treatment in such cases, it must be appreciated that the spine to be at its best must be used with the body fully erect, in which position the joints are held midway between full flexion and full extension.

With the wrist the strong position is midway between full flexion and full extension. Either one of these, full flexion or full extension, if kept for long, will mean strain and weakness. The same is true with the spine, an habitual posture which is one of either complete flexion or extension will inevitably lead to strain, partly because of the strain to the ligaments and partly because the tip of the articular processes are forced to withstand more continuous pressure than is normal. Also in the extended position

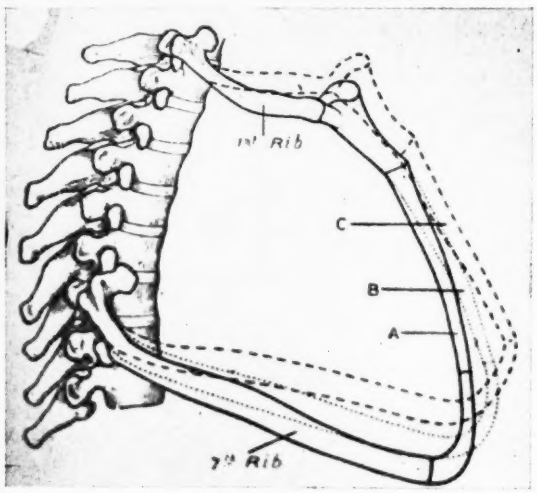


FIG. 10. A sketch taken from Gray's Anatomy showing the normal position of the rib with reference to the spine with the downward inclination from the horizontal of about 30 degrees. The range of normal motion is here indicated.

the joints are locked together more than is normal, with the result that there is less yielding in movement so that wrench or strain is more easy to produce.

With the lumbar or low back cases, the common relaxed posture results in the use of the spine in complete extension, this being true with the lumbosacral or the dorsolumbar cases. In the middorsal region, with the rounding of the back, the joints are used with extreme flexion, not only rendering these joints easy of strain but at the same time putting an unnatural strain

upon the costovertebral joints. With these latter joints there is a very limited range of motion and when the body is used erect, the neutral position is midway between full inspiration and expiration, with a downward inclination of the ribs of about 30° (fig. 10). When the body is dropped or sagged, the ribs are held at the position of complete sag, or flexion, and with the extreme downward inclination of the ribs, that is part of the very flat chest that has been cultivated of late, not only are these joints crowded together in the flexed position, but since the range of motion in these joints is very limited, the extreme position can only be taken when the dorsal spine is sagged or rounded or when the costovertebral joints have become relaxed.

Under such conditions there must be a tendency for the rib to drag forward away from the spine with resulting relaxation of these joints. This relaxation, together with the fact that the ribs are used at the position of extreme sag or flexion, which position involves a twist from the normal axis of the rib, makes it possible to slip or displace the rib at its articulation with the tip of the transverse process. If this latter articulation is on the top of the process (fig. 5B), the leverage represented by the rib as it sags downward, may easily slip the head of the rib upward and forward. If the articulation is on the anterior surface of the process (fig. 5A), the slip or strain is more likely to be at this point. The pain in these cases is, naturally, referred to the chest wall, as well as the back, the exact location depending upon the level of the joint affected.

With pain referred to the cervicodorsal or the mid-cervical region, extreme extension long continued is the essential feature and with this corrected, not only will the articular processes be used in the proper midway position, but the spinous processes will be separated, as well as the transverse processes at the cervicodorsal juncture.

With the sacro-iliac joints, the common position in the painful cases is with the sacrum and the whole pelvis forward at the extreme of the possible motion in this direction, which is itself enough to produce strain of these joints, but when, at the same time, the spine is used at extension, the thrust of the upper body and spine tends to still further drag the top of the sacrum downward and forward.

Recognizing these factors, the treatment of all of these cases consists first in correcting the faulty mechanical features. In most of the cases the symptoms have developed in adult life so that even though anatomic peculiarities exist, they had always been present and become troublesome only when the faulty use of the part had become a habit. With treatment the peculiar anatomy cannot be changed but since this in earlier years had caused no trouble, treatment should restore the patient to that which existed previously.

Since the pelvis is the structural base of the body, naturally, in correcting the faulty mechanics of any part of the spine, this must be corrected first. The marked forward tip of the pelvis (fig. 11), should be overcome, so that the

FIG. 11. The lateral lumbar spine with the marked forward position of the pelvis which results in the extreme relaxation of the body, not only producing strain to the pelvic joints and low lumbar spine, but producing also the downward sag of the ribs with the marked posterior displacement of the lower ribs. This position of the ribs can only occur when the costovertebral joints are strained or displaced.

weight of the spine is borne upon the top of the sacrum (fig. 12), in which position the sacro-iliac joints are used in balance, the neutral position being between full flexion and full extension. In this position the drag upon the sacral plexus as it crosses the sacro-iliac joints is overcome, and the articular processes at the lumbo-sacral joints being no longer used at the point of full extension, the narrowing of the foramina at that level is overcome, with relief of the common irritation of this part of the lumbar plexus. With these two features recognized, the common leg pains, usually called sciatica, should cease.

For the lumbar cases, since the position of extreme extension is usually associated with the

unnatural position of the pelvis, the correction of this latter feature largely corrects the faulty position of the low spine. The intent in such cases is to overcome the usual contraction of the tissues of the extended position and make possible the extreme of the fully erect position. Both extremes should be easy to take before the neutral, midway position becomes the habit. The lumbar spine must be flattened, as well as the buttocks drawn down.

With the dorsolumbar cases, the same things are required as have been described for pain lower down, but the low ribs make it necessary to see that the ribs are raised well up in front and that the chest is spread laterally so that the common downward sag of the ribs at the sides is overcome. As the standard for working with these cases it should be remembered that the diameter of the chest at the tip of the sternum should be for the anteroposterior about two-thirds of the lateral. In most of the cases with the pain at the dorsolumbar region the so-called kidney cases, the lateral diameter is less than normal. To increase this means raising the ribs at the sides and the breathing must become more lateral in movement than anteroposterior.

For the middorsal cases with the costovertebral joints chiefly at fault, the lower spine should be treated as has been described, by which the ribs will be so fully raised and the dorsal spine flattened, as to largely relieve the symptoms, but if there is much relaxation of these joints, the position of the chest must be worked at until the full elevation, as in full inspiration, becomes easily possible and until the neutral position in standing or speaking is midway between full inspiration and full expiration. Once this has been accomplished rarely is anything more required for these cases, and the irritation of the intercostal nerves, which is one of the most troublesome symptoms, is overcome.

For the cervicodorsal, or midcervical cases, the correction of the common faulty mechanics below is usually enough to flatten the cervical spine, with the relief of the pain. In this region, as well as below, the desired position is with the spine used midway between full flexion and full extension. As the patients are seen the position of full extension is the common one, so that to relieve the symptoms the neck must be flattened and the head held erect well over the shoulders, but this cannot be unless the faulty curves of the lower spine are also corrected. With the cervical spine thus used, the lower transverse processes are held apart, with relief to the irritation of the brachial plexus at this point. Even though the processes are abnormally long, if they caused no trouble earlier in life, they should cease to be troublesome with the correction of the acquired features.

The aim as the first part of our treatment in all of these cases, should be to see that the body

FIG. 12. The lateral position of the lumbar and low dorsal spine showing the bones of the spine in excellent position midway between full extension and flexion, showing the high, well-placed diaphragm and with the ribs in their proper inclination.

is used so that the spinal joints will be naturally held midway between flexion and extension. This should be basic, and after this has been accomplished such other treatment as may be required can be given.

To accomplish this basic need, or correct body balance, special positions and exercises are of use, and commonly apparatus in some form is used but always with the aim of leading, ultimately, to the body being used with the spine having its normal curves and, consequently, with the special joints naturally held midway between full flexion and full extension.

In case for any reason there must remain some permanent weakness, and operation for fusion of the joints is to be considered, this should not be undertaken until the spine has been brought to as nearly the ideal position as possible. With cases of infantile paralysis, or lateral curvature, this is particularly true. The relatively short life that is expected with such cases is rarely due to the primary conditions, but to the gradual increase in the deformity which not only produces greater strain to the spine but also results in greater interference with the viscera. With these cases much is to be expected from operation but only after the parts have been restored to as nearly normal as it is possible to obtain. To fuse, as the patients first present themselves, makes the deformity permanent. Obtain the best possible result and then hold it with apparatus or by operation if necessary, but use neither if it is possible for nature to do it without permanent assistance.

A PLEA FOR THE MORE EXTENDED USE OF PNEUMOTHORAX THERAPY IN THE HOME TREATMENT OF PULMONARY TUBERCULOSIS

BY JOHN B. HAWES, 2ND, M.D.,* AND MOSES J. STONE, M.D.*

ONE of the very real difficulties that besets us in our endeavors to eradicate tuberculosis is the prevalent opinion not only among the laity but in the medical profession that consumption is in the process of becoming a thing of the past, along with typhoid fever and other diseases. Glowing reports of a mortality rate reduced from 300 per 100,000 in 1910 to 65 per 100,000 in 1930; statistics showing that pneumonia, cancer and heart disease now rank higher than tuberculosis as causes of death all tend to distract our attention from this disease or at least to minimize its influence. And yet what are the facts in the case? The answer, clear and plain, is that tuberculosis, between the ages of 18-40 years—the period of man's greatest usefulness, is still the major cause of unhappiness, chronic invalidism and death in this country, not to mention economic loss as well. Surely such facts as these are worthy of serious consideration.

That this state of affairs is taken seriously from the official viewpoint, certainly in Massachusetts, and to an ever-increasing extent elsewhere is shown by the number of beds in sanatoria for the tuberculous that is steadily growing every year. Taking as the goal to be reached so far as institutional requirements are concerned, two beds for each death, Massachusetts now has 1.8 beds for each death from tuberculosis. But even when the desired figure of two beds per death is reached, will our problem be solved? Unfortunately, no. Those who have studied this question assure us that we have hardly even scratched the surface so far as finding early cases of tuberculosis is concerned. And again even with what we choose to call adequate sanatorium provision, the majority of consumptives for one reason or another—sometimes good, usually bad—will continue to take home treatment in place of going to an institution and certainly must take home treatment before and especially after a sojourn in a sanatorium. The average length of treatment of any one case of tuberculosis is two years and usually more; the average length of stay in even the best-run institution is rarely one year.

It is evident then that despite our firm belief, and we are sure that it is likewise the firm belief of the medical profession, in what sanatorium treatment has to offer as an educational and a remedial measure for the consumptive, home treatment carried on more or, we regret to say, usually less efficiently must be depended upon to do the bulk of the work in arresting the patient's disease and in restoring him to health and efficiency.

What are the chief disadvantages of home treatment? First of all is lack of proper medical supervision. In a sanatorium or at a health resort such as Saranac Lake, New York, or Rutland, Massachusetts, the patient is seen by his physician every day or at least every few days and is under the constant supervision of his nurse. At home in the vast majority of cases this, for obvious reasons, is impossible. A second great disadvantage of treatment at home is the danger, ever present, of infecting others, especially children. This at a well-run sanatorium might be said to be non-existent. Finally, there are other reasons that militate against home treatment in that because of lack of proper and constant supervision, complications as

*Hawes—President, Boston Tuberculosis Association. Stone—Assistant Professor in Diseases of the Chest, Boston University Medical School. For records and addresses of authors see "This Week's Issue," page 758.

they arise, especially hemorrhage, are not given prompt and adequate treatment and thus the disease is prolonged. But, granting as we well may that home treatment despite its various obvious disadvantages as enumerated above must play and for a long time to come must continue to play a vital part in our treatment of tuberculosis, it is obvious that any measure which will in whole or in part do away with these handicaps to proper treatment at home should be of inestimable value. We are firmly of the opinion that compressing the diseased lung by means of pneumothorax in early and in other properly selected cases is such a measure.

In a recent address, Dr. J. Arthur Myers* made the following remarks very pertinent to what we are here discussing: "Recent advances in collapse therapy are doing great good for individual patients, but a greater good by closing off lesions which otherwise would be sources of exposure to vast numbers of people. The discovery of the fact that many patients may remain ambulatory while artificial pneumothorax is being induced, or soon afterward, promises to do much to relieve congestion in rooms, wards and hospitals for tuberculous patients, to relieve the patient of economic strain, to relieve the taxpayer of a considerable burden and to prevent the spread of tuberculosis." These are wise words but how little noticed or understood in New England! Last year we called attention† to the widespread use of pneumothorax and similar procedures outside of New England and showed that the consensus among authorities on this subject was that forty to sixty per cent of all tuberculous patients should receive some form of compression therapy. In contrast to this, we emphasized the deplorable neglect of such measures in New England in that only four per cent of the tuberculous in the New England states received any form of collapse or compression treatment! The situation since last year has improved somewhat but we would again call the attention of the medical profession to this situation as shown by these figures and emphasize the fact that even now there must be hundreds if not thousands of consumptives in our midst who are dying or whose illness is being needlessly prolonged because no form of compression therapy has been used or used too late.

Although everything that we may say concerning the value of pneumothorax treatment in tuberculosis applies with as great if not with greater force to the patient under constant supervision in a sanatorium, we are confining ourselves here to its use as an adjunct and aid to treatment carried on at home. We spoke of lack of proper supervision as one of the disadvantages of home treatment. A patient in the early stages of artificial pneumothorax *must* see his doctor or have his doctor see him for refills often every other day and certainly twice a week for several weeks and once a week or ten days for many months. And the wise physician takes advantage of these frequent visits to do a great deal more than merely to introduce a certain amount of air into the pleural cavity. The second great disadvantage of home treatment was the ever-present danger of infecting others especially children. Although it does not happen in every instance, in many cases it certainly does hold true that following the collapse of a lung by means of artificial pneumothorax the sputum which for months or even years previous had been invariably positive becomes negative to tubercle bacilli, and remains so. This alone is of tremendous importance. Likewise, among other handicaps to efficient treatment at home we referred to certain complications, notably hemorrhage, which surely requires quick and efficient treatment. Pneumothorax might be said to be the only treatment of any value in this particular complication. One grants at once that pneumothorax does just as much good in controlling a pulmonary hemorrhage when the patient is inside a sanatorium as outside. But, and this is of importance, there are certain types of hemorrhage in tuberculosis which occur when the patient is apparently in the best of health and is leading a normal life that are due to the mechanical tearing off of a scar or adhesion in a fibroid phthisis that can be treated safely and efficiently in the home by means of collapsing the lung, which means doing away with prolonged bed rest at home or elsewhere. Here, if the disease is unilateral and in other ways suitable for it, artificial pneumothorax may do wonders. Oftentimes all bleeding ceases as if by magic; both temperature and pulse quickly drop to normal while coughing and raising is reduced to little or nothing. Often after a comparatively short period in bed the patient is able to come to the office for refills and in many cases in a few weeks is able to resume his work, of course providing that this is not too strenuous. In such cases, were it not for compressing the lung, the disease might advance steadily despite prolonged bed rest in or out of a sanatorium while in addition with continued bleeding without pneumothorax there is always the danger of infecting other areas of the lung and of developing a tuberculous bronchopneumonia. But even without the occurrence of such complications which unfortunately are all too common even under the very best conditions, without pneumothorax or its equivalent many months must usually elapse before the patient is able to return to work, with the danger, and in the patient's mind the constant dread, of another hemorrhage at any time. With compression of the lung all this may often be obviated.

The following brief case reports are striking examples of what pneumothorax can do in making the home treatment of tuberculosis more effective:

*Myers, J. Arthur: Recent developments in our knowledge of tuberculosis. Am. Rev. Tuberc. 27:121 (Feb.) 1933.

†Hawes, J. B., and Stone, M. J.: J. A. M. A. 98:2048-2051 (June 11) 1932.

A. Z., aet. 29. This man when referred to us had been taking home treatment for over a year. Although his general condition was good his sputum remained strongly positive and he had occasional small hemorrhages. Pneumothorax was instituted in July, 1928. The sputum became negative in two weeks' time and has remained so. There has been no more bleeding. He went to work as a clerk in a store a month after his first pneumothorax treatment and has continued to work ever since. He is apparently perfectly well at present. (Cf. plate.)

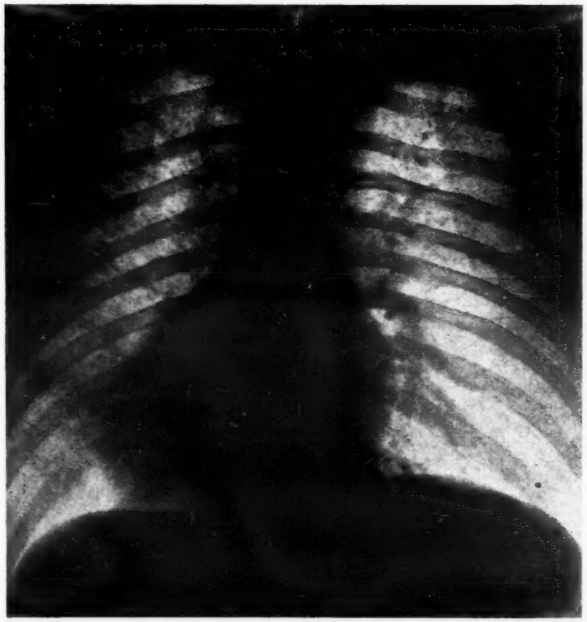


FIG. 1. A. Z. I. Before pneumothorax.

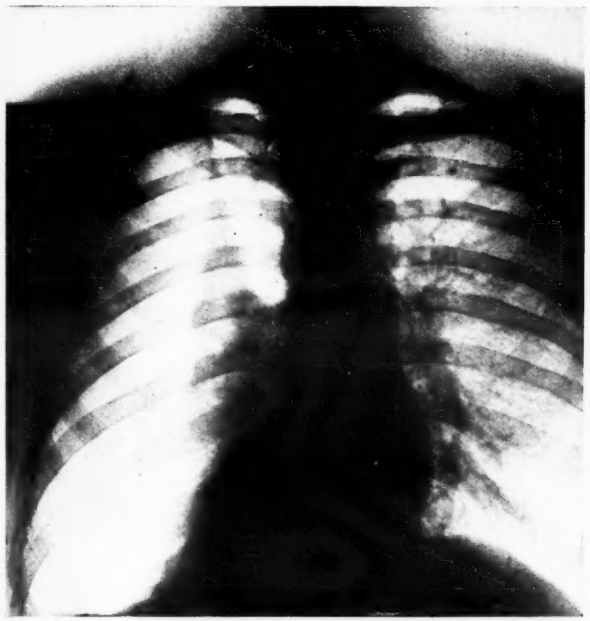


FIG. 2. A. Z. II. During pneumothorax treatment.

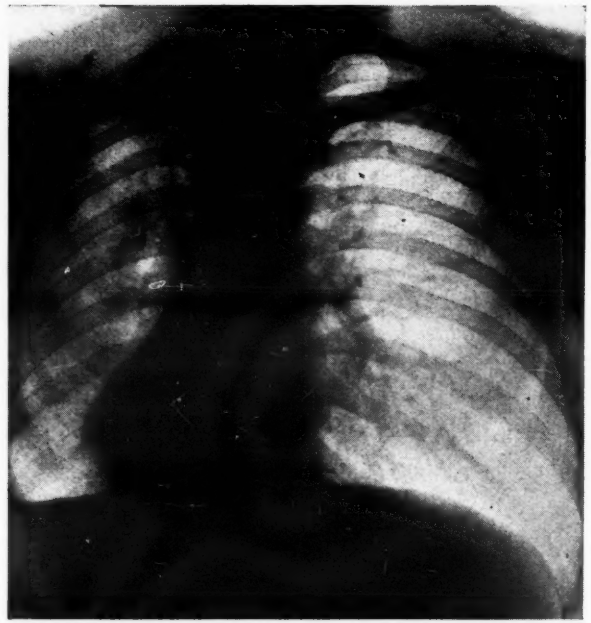


FIG. 3. A. Z. III. Lung reëxpanded.

M. R., aet. 29. This patient had a considerable hemorrhage in 1928 and again in December, 1929, when we first saw her. Her general health was excellent, but there was a marked fibroid process at the right top with cavity formation. Pneumothorax was done January 15, 1930. Almost immediately all bleeding, coughing and raising ceased. She went back to work in three months and has worked steadily ever since until her marriage recently. She is now apparently in the best of health with her lung completely reëxpanded. Pneumothorax treatment was continued to September, 1932, refills being given at her physician's office. (Cf. plate.)

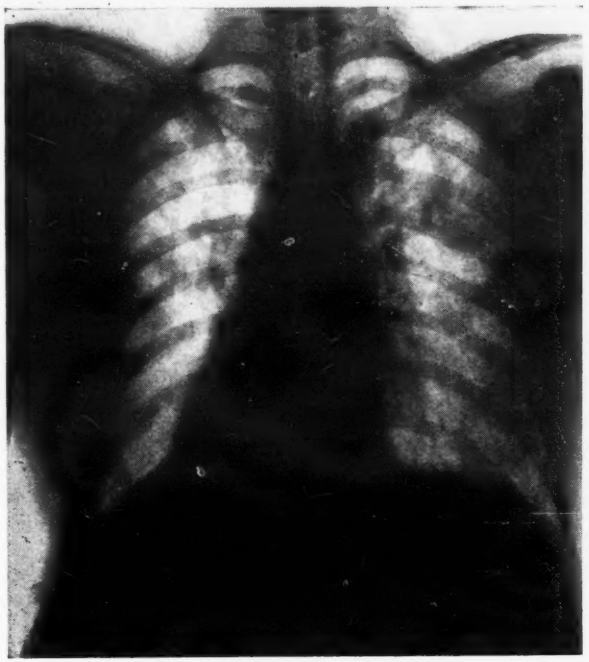


FIG. 4. M. R. I. Before pneumothorax.

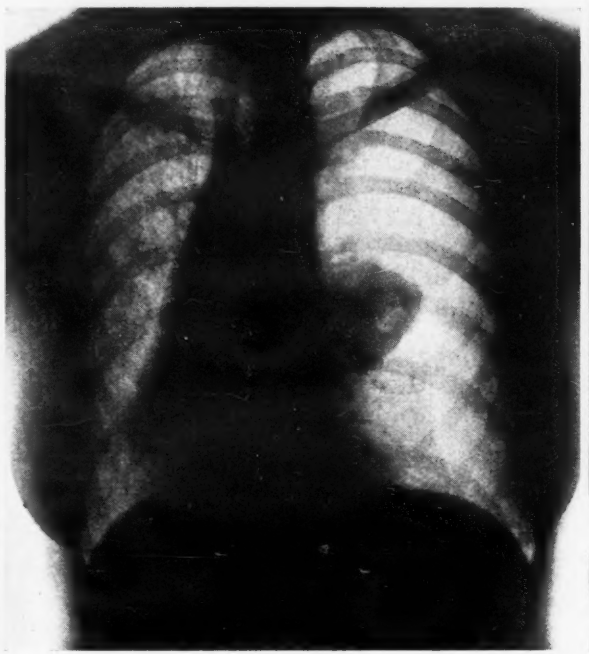


FIG. 5. M. R. II. During pneumothorax treatment.

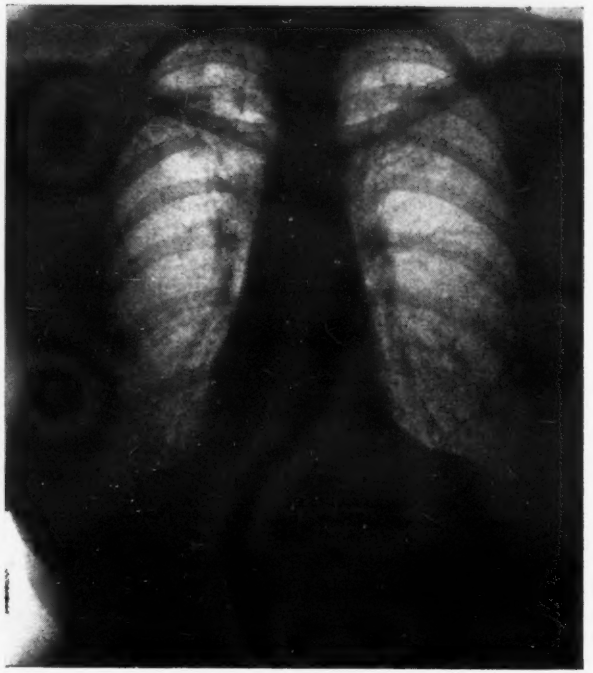


FIG. 6. M. R. III. Lung reëxpanded.

S. L., aet. 20. This patient was first seen August 10, 1928 with active tuberculosis, high temperature and rapid pulse and a fairly extensive process with cavity formation over the lower half of the right lung. The sputum was positive. She was sent to a local sanatorium for a year, where despite prolonged bed treatment and the closest supervision she made no gain. Pneumothorax was started June 12, 1929. She stopped coughing at once and no sputum could be obtained for a test. She returned to work in a few months and has worked ever since. Pneumothorax treatment was continued until February 29, 1932. The lung is now completely reëxpanded and is apparently normal and the patient herself is doing well. (Cf. plate.)

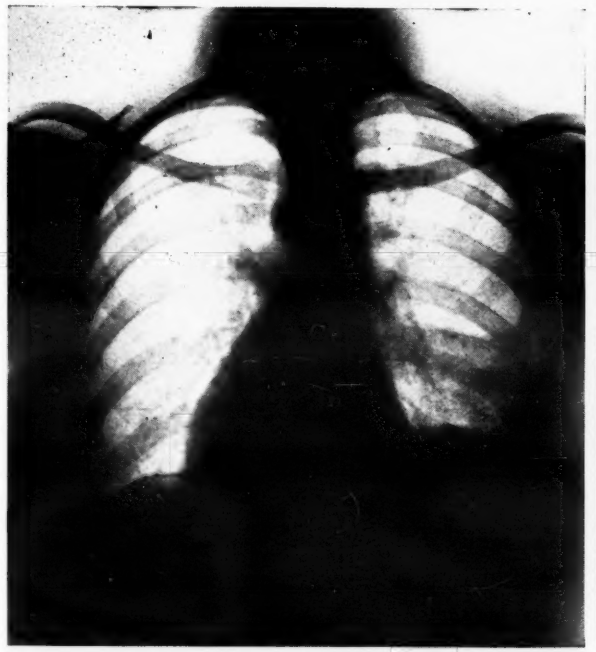


FIG. 7. S. L. I. Before pneumothorax.

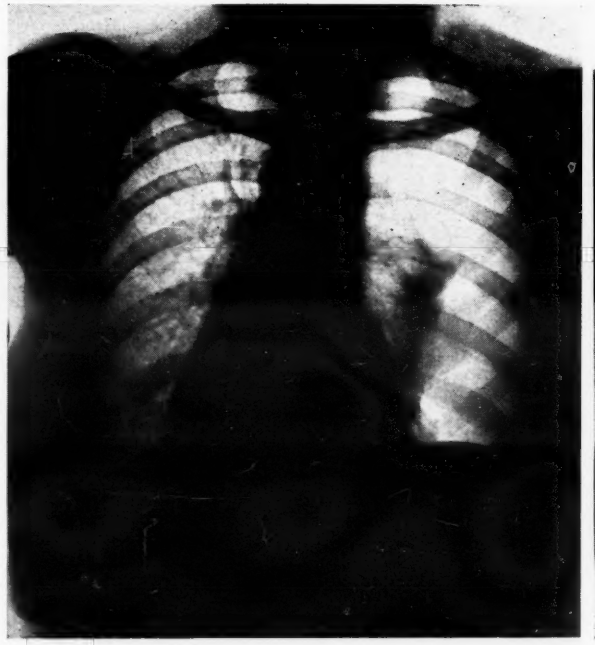


FIG. 8. S. L. II. During pneumothorax treatment.

FIG. 9. S. L. III. Lung reëxpanded.

A. H., aet. 19. We first saw this patient April 30, 1927 with an active process at the right apex with cavity formation. There was a history of considerable bleeding. The sputum was positive. After six months of home treatment with unsatisfactory results, pneumothorax treatment was commenced in September, 1927. Cough and sputum at once practically disappeared and the sputum, such as there was, became negative. In a few months she resumed her course at an art school and for the past three years has been working regularly. Pneumothorax was continued until March, 1931 when the lung was allowed to expand. The patient is now in perfectly good condition in every way. (Cf. plate.)

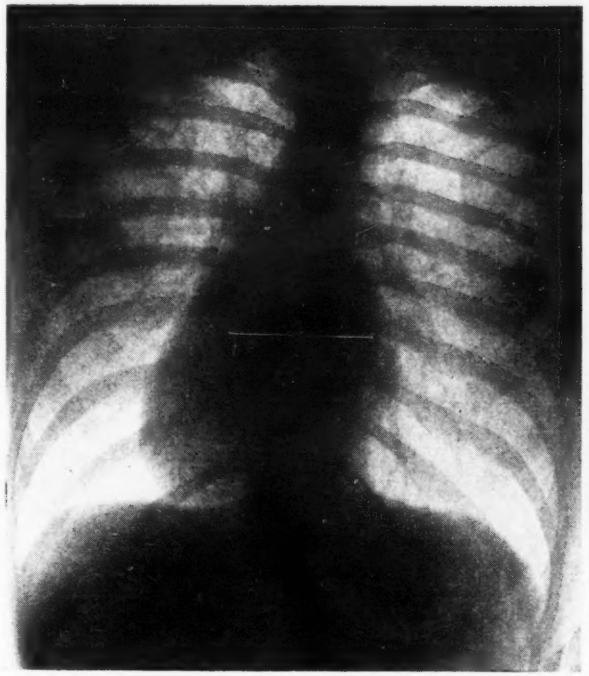


FIG. 10. A. H. I. Before pneumothorax.

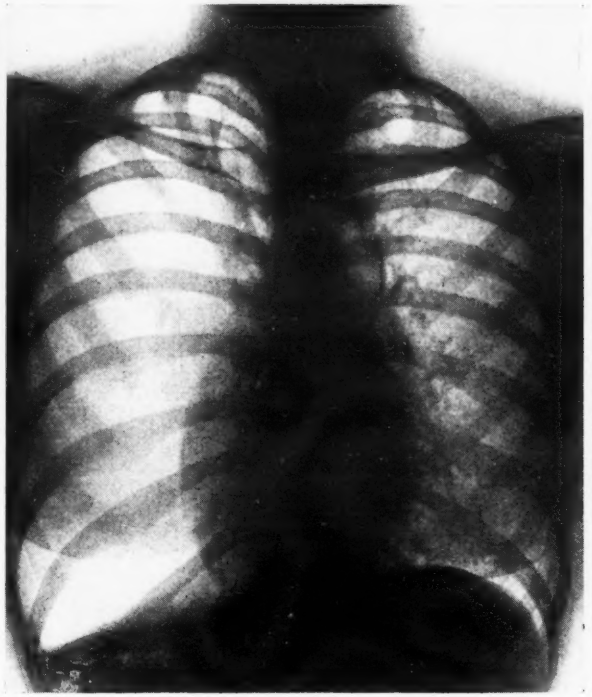


FIG. 11. A. H. II. During pneumothorax treatment.

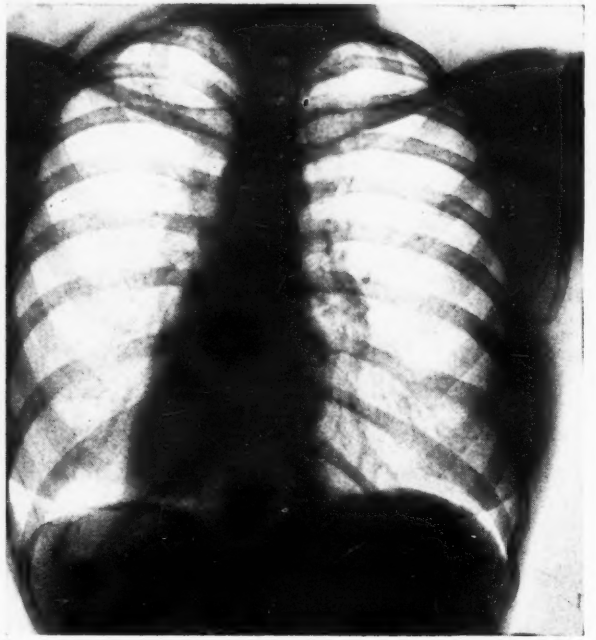


FIG. 12. A. H. III. Lung reëxpanded.

We began the use of pneumothorax as a home and office procedure four years ago and since then have treated in this way over 100 patients. A few of these had been receiving pneumothorax at some sanatorium, we merely continuing the treatments at our office. With these few exceptions, compression therapy was begun by us. The first treatment is invariably given in the home but as soon as possible subsequent refills are given at the office.

It must be borne in mind that compressing or collapsing the lung by means of pneumothorax is a surgical procedure and requires absolute asepsis but this can easily be brought about wherever there is boiling water. We have done pneumothorax in a summer camp where a kerosene heater was the only means of sterilizing the instruments. In every case it is advisable to have the assistance of a nurse which can easily be arranged through the local community health association. The refills are given at frequent intervals at home until the patient is able to come to the office.

Many patients resume their former occupations while still under treatment, some of them coming in for a refill during their lunch hour, while many are glad to report on Saturday mornings for this purpose. Of great importance are frequent fluoroscopic examinations before and after refills. This is absolutely indispensable for only in this way can the amount of compression, mediastinal displacement and the formation of small amounts of fluid be definitely ascertained. Complications, comparatively rare, especially excessive amounts of fluid, are treated as they arise. The amount of gas to be given is gauged chiefly by the manometric readings, always avoiding positive pressure.

We wish to make it clear that pneumothorax is not an operation to be done at home by those untrained and unfamiliar with its use, nor indeed can it be used in every case. The indications for it are, a unilateral process and especially as a means of checking hemorrhages. These are too well known to be gone into in detail here. But we are strongly of the opinion that therapeutic pneumothorax properly done in suitable cases is a valuable and important adjunct to the home treatment of tuberculosis. We admit that under ideal conditions, such a procedure should be done in a sanatorium under strict and constant supervision. Unfortunately, as we have shown above, institutional treatment is available for only a small part of the patients with tuberculosis and only for a small part of the time. The most important part of any tuberculous patient's treatment takes place *before* and especially *after* he leaves a sanatorium. If we in New England are to progress as we should in alleviating the ravages of tuberculosis which, as stated before, between the ages of twenty to forty years is still our greatest cause of death, we must take advantage of compression therapy far more than we are at present. We are firmly of the opinion that a more extended use of pneumothorax and a further dissemination of the value of compression therapy in pulmonary tuberculosis will go far toward reducing the mortality from tuberculosis and will help to prevent its spread and to alleviate much unnecessary sickness that tuberculosis now causes.

CLINIC AND FIELD AGENCY RELATIONSHIPS IN SYPHILIS AND GONORRHEA CLINICS*

BY MRS. EVANGELINE H. MORRIS, R.N.†

WITHIN the past few years many communities have studied the health problems associated with syphilis or gonorrhea. These studies have contributed valuable information relative to the incidence, distribution and etiology of disease. In November of 1931, the plans of the Massachusetts Society for Social Hygiene for a different type of a study, placing its emphasis on community resource and agency relationship, were completed and the field work commenced.

Object. This study was undertaken by the Society at the request of the Community Health Association, where it was felt that some plan should be worked out with the local clinics in order to justify the continuation of that portion of the nursing program concerned with the care of persons with syphilis or gonorrhea.

Plan. Originally the plan was outlined to include a comprehensive study of relationships between clinic and field agency. Subsequently it became necessary to consider those administrative problems exerting a direct influence on relationships.

Scope. Since the largest number of the Community Health Association's joint cases are carried with the Massachusetts General Hospital, that institution was selected as the logical place to begin work. Diverse factors influenced the inclusion of other institutions. In order to secure a complete picture of community resources the Boston City Hospital and the Boston Dispensary were included. The Beth Israel Hospital was considered for the problems peculiar to the smaller clinic; the Long Island Hospital for the group of children with vulvovaginitis; the Eye and Ear Infirmary for cases of interstitial keratitis and ophthalmia neonatorum and the Boston Psychopathic Hospital for the work with the neurosyphilitic patient.

*A study made for the Massachusetts Society for Social Hygiene, Inc., under the direction of an Advisory Committee consisting of Mrs. Marda H. Solomon, Miss Florence M. Patterson and Dr. Nels A. Nelson, with Mrs. Dorothy W. Miller as Editorial Assistant.

†Morris—Social Hygiene Supervisor, Community Health Association, Boston. For record and address of author see "This Week's Issue," page 758.

Method. In the larger clinics the worker was enabled to become temporarily part of the staff. This coöperation on the part of the hospitals increased the validity of the material. In each institution members of the medical, administrative and social service departments were repeatedly consulted in order that the findings might be comprehensive and unbiased. In each clinic, free access to medical and social records made it possible for all the material to be carefully checked.

Since this field work extended over a period of nine months and covered certain clinics and activities in seven institutions,* a tremendous amount of material was collected. Part of this material dealing with the special problem of the individual clinic has no place in a general article. This material, however, has formed an important part of those reports† which were given by the Advisory Committee of the Society to each of the various hospitals and clinics to which they pertained.

In a general article, moreover, an abstract of the total findings seems of less value than an amplification of the sections which shed light on the entire community problem. These divisions logically include certain administrative procedures as well as the actual treatment of the patient. The observations made of the care of the pregnant women, the congenitally syphilitic and the openly communicable infection are, with rare exceptions, common to all the clinics and tend therefore to reveal the level of community accomplishments for these groups. The problem of follow-up in the case of young married couples and of the young unmarried promiscuous girl is also included since it represents a common difficulty.

Syphilis in Pregnancy

In the interest of preventive medicine the care of the pregnant woman with syphilis is of greatest importance. A first step in the right direction is the accepted policy in the prenatal clinics of including a routine blood test in the preliminary physical examination. The majority of these patients are well advanced in the seventh month of pregnancy at the time of this initial visit. Certain ones in this group give evidence of syphilis in the form of positive serology—or a suggestive obstetrical history. Here is a situation calling for prompt action. It is met by delay.

The relationship between the prenatal and skin clinics is weak and thus these indications for an interdepartmental "refer" are frequently ignored. The patient is not referred to the syphilis clinic until after her second appearance in the prenatal department. Nor is the coöperation of the nursing organization giving prenatal care in the home enlisted until after this second visit. Following this procedure an interval of six weeks elapses before the patient in her third visit to the hospital is seen in the skin department. A second blood test is then taken and the patient advised to return in one week. On the fourth visit the diagnosis is confirmed and treatment may be instituted.

Even if these delays are overcome, definite obstacles remain. Patients are supervised for pregnancy and treated for syphilis on different days in the largest institutions. They are referred from the hospital devoted to obstetrical work to other institutions for antisyphilitic treatment. Obviously, this requires additional initiative, time and carfare; this last forms a serious barrier not to be ignored in these years of privation. Thus to the burden of syphilis as a complicating factor in pregnancy, material difficulties are added. It is not strange that many records reveal that diagnosis was incomplete, treatment inadequate or not attempted, and that the end of the devious route from the prenatal to the syphilis clinic frequently found the patient at term.

There is also a general failure on the part of prenatal clinics to assume any responsibility for the continuation of antiluetic treatment after delivery. The opportunities offered during the postpartum period for advising a return to the skin clinic are not utilized.

There was found a by no means inconsiderable number of patients whose blood was positive but who remained undiagnosed since, during pregnancy, they failed to reach the syphilis clinic. Follow-up for this group is attempted by the field nurse, since she is usually the only person active at the end of the postpartum period. Unless the pregnancy has terminated in the birth of a living syphilitic child, it is difficult to persuade these patients that further diagnostic measures are indicated.

If adequate protection for these patients is based on at least three months' intensive antisyphilitic treatment, with frequent examinations and therapy as indicated thereafter, the majority are receiving inadequate care.

CASE ILLUSTRATIONS

On January 30, 1932, a young American woman attended the prenatal clinic in a hospital not equipped to treat syphilis. She was found to be five months pregnant and was told to return in one month. On February 27, she was advised to report to the syphilis clinic of another hospital since her blood was positive. She followed this advice and on March 9, a second blood test was also positive. A diagnosis of latent syphilis was made and when the patient returned on March 26, treatment was started, two months after her first visit to the prenatal clinic.

On October 26, 1931, a colored woman in the fourth month of her third pregnancy attended the prenatal clinic. Blood tests taken on that day were

*Massachusetts General Hospital, Boston Dispensary, Eye and Ear Infirmary, Long Island Hospital, Beth Israel Hospital, Boston City Hospital, Boston Psychopathic Hospital.

†It is the hope of the Advisory Committee of the Massachusetts Society for Social Hygiene that these reports and their accompanying summary and recommendations may be the basis for certain indicated changes in policy and procedure, and that these changes may eventually be adopted in other communities where the same situations prevail.

positive. A notation on the record dated January 20, 1932, stated that the Kahn test should be repeated. This patient made five visits to the prenatal clinic without being referred to the syphilis clinic for consultation. The baby born March 26 was sent into the hospital by the visiting nurse, who discovered snuffles. On examination, the baby, his mother and three year old sister were all found to have syphilis.

In one hospital, a series of twenty cases were selected for study in the order of their arrival in the clinic. These averaged a seven months' pregnancy at the initial visit and an average of six weeks had elapsed between the finding of a positive blood at the prenatal clinic and the patient's appearance at the syphilis clinic.

In November of 1931, sixteen of these patients fell into the group of lapsed cases. The last clinic visit was made within a few days of the expected date of delivery. The lapsed period averaged six months and two weeks. For the purposes of this study it was decided to look up these patients and to secure the following information:

I. Does the patient understand the importance of continuing treatment?
II. What was the outstanding difficulty which prevented her return to the clinic?
III. Will she return within two weeks?

Three of the sixteen patients were not located. Of the remaining thirteen, nine apparently understood something of the value of therapy; four stated that they did not. Among the obstacles to clinic attendance were two cases of extreme poverty, including lack of carfare; three families of small children who could not be left to the care of relatives or neighbors; one woman said that she could not spend a morning each week in the clinic; one objected to the pain associated with treatment; one felt that the clinic personnel had been discourteous; two patients were convinced that they were cured and two understood from statements made at the postpartum examination that they need not return; one woman insisted that treatment had caused the baby to be stillborn; since she was again pregnant she was determined to avoid clinics.

The nurses who coöperated in this follow-up effort reported that nine patients would return to the clinic within the stipulated time; eight came in promptly and four at later dates; eventually all except one returned to clinic care. Three husbands presented themselves for examination; two were found to be under the care of another institution. Two babies were stillborn; of the eleven living ones located, five were examined and found negative; two had congenital syphilis. Of the six older children in these families sent in for examination, two were found to be congenital syphilitics.

Among the factors which contributed to the ineffective care of these patients was the failure on the part of the prenatal clinic, the syphilis clinic and the field nursing agency to give a proper estimate of the value of continued treatment. These agencies also failed to utilize opportunities to secure examinations for other members of the family, and thus left an impression that the whole matter was relatively unimportant. The prenatal clinic and the nursing agency closed their cases prematurely without fixing responsibility for follow-up and the follow-up work of the syphilis clinic was obviously weak and ineffective.

CASE ILLUSTRATION

A young married woman with one child was referred to the syphilis clinic by the prenatal clinic in the sixth month of her pregnancy, June 29, 1931. Diagnosis: Early syphilis, non-infectious. Received eight injections of neoarsphenamine. Last seen August 17, 1931. Baby born September 4, 1931—not examined. Husband supposed to be under the care of another hospital. Older child not examined. Case referred for investigation December 10, 1931. Reason for not returning to clinic was economic. Returned to the clinic with husband and two children January 11, 1932.

Congenital Syphilis

In view of these findings in the care of patients during pregnancy, and more particularly if this situation continues, it is reasonable to assume that the problem of congenital syphilis will not disappear. In fact, the institutions covered by this study were carrying an active case load of approximately 200 patients definitely diagnosed as having congenital syphilis. If recent statistics are comparable, this represents exactly twice the number of such patients to be found within the entire boundaries of Denmark.

Adequate medical and social treatment for children with congenital syphilis involves years of treatment, repeated periodic examination, family adjustments, great expense, special consideration for the handicapped and the examination of parents and siblings.

Perhaps the most encouraging aspect of this situation is the work being accomplished with the infant and preschool group. Since at the time of diagnosis many of these patients had openly communicable infections they received the benefits of long time intensive care in the hospital. The parents repeatedly demonstrate both willingness and ability in arranging for the necessary regular appearance in clinics. The majority of these children are referred to social service and accepted for intensive family case work*.

*The effort made throughout the study to adopt the terminology used in the various hospitals in reference to social work is unsatisfactory. The failure to draw a distinct line between the major and minor case, contact interview and slight service, intensive and non-intensive work is due partly to the wide variety of interpretation which governs these terms in the several institutions.

In discouraging contrast to this is the management of the congenital syphilitic diagnosed in adolescence. Indications which might have led to an earlier diagnosis were frequently ignored. In one hospital it was found that thirty per cent of these patients had been known to various clinics for almost two years before consultation with the syphilologist was advised. Obviously, these children of school age must attend clinic on Saturday mornings. Unfortunately these clinics, particularly in the winter time, run a heavy load in providing care for the adults and school children with all the various dermatological diseases to which they are subject. Thus treatment which is begun late is also frequently interrupted by the patient who grasps any excuse to claim the freedom of his one day away from school and to avoid the long delays of an overcrowded clinic.

CASE ILLUSTRATION

One sixteen year old girl offers a tragic illustration of the results of our present system. Although she was known to the pediatric service in 1925, and to the eye and ear department in 1927, it was 1929 when she arrived for consultation in the syphilis clinic. At this time she had a positive blood, her teeth were Hutchinsonian and both eyes scarred from interstitial keratitis. In spite of fairly regular treatment during the past three years, there are indications that juvenile paresis is developing. In the four years which were allowed to elapse without treatment, something better might have been accomplished.

In one hospital the records of sixty patients with congenital syphilis who reported for treatment at least once during the period of this study were analyzed to determine:

1. What agency or factor was responsible for bringing these children under care.
2. Whether an earlier contact with the syphilis clinic was indicated.
3. Whether this infection had resulted in serious handicaps.
4. How much had been accomplished in familial examination.

In answer to the first question, twenty-two had come directly to the clinic, six were referred by outside agencies and the remaining thirty-two from other clinics and social service. Twenty-six of these patients had been under care in other clinics for an average of one year and eleven months before consultation with the syphilologist was advised.

That an earlier contact with the syphilis clinic was indicated is shown by the fact that in addition to a positive blood, forty-seven of these patients had one or more of the classical symptoms of syphilis, such as interstitial keratitis, Hutchinsonian teeth, sabre tibia, prominent frontal or parietal bosses, specific periostitis, saddle-back nose, deviated septum, congenital facies, juvenile paresis, chronic otitis media, and optic atrophy.

This infection had certainly resulted in serious handicaps for eighteen patients, twelve of whom were diagnosed as having interstitial keratitis, two optic atrophy or total blindness, three juvenile paresis and one total deafness.

Familial examination of these patients was incomplete. Of the fifty-seven families represented by these sixty patients, thirty-three have received the benefit of examination which was complete for only eight family groups and incomplete for the remaining twenty-five. The remaining group of twenty-four have, according to the records, not been examined and for only six of this number is there any reference to the family health situation.

Summing up the situation in regard to congenitals, it may be said that the majority of the cases of congenital syphilis now active in the local syphilis clinics came to the attention of the syphilologist when infancy and early childhood were past. Many of them were first seen with a well-developed interstitial keratitis. Treatment not only began late but has also been frequently interrupted by the non-attendance of these children after they reach adolescence. At this stage they are regarded by many workers as representing the most difficult portion of the follow-up problem.

Obviously better results are obtained both from the medical and social standpoints when treatment is instituted in infancy. At present insufficient effort is expended to provide these good results. The infants of syphilitic parents often remain unexamined, and in other departments in the hospital frank indications for a consultation with the syphilologist are frequently ignored.

Openly Communicable Cases

While it is true that an ever-increasing number of patients with all forms of syphilis are turning to the outpatient departments for medical care, this increase is particularly noticeable in the group of early and openly communicable cases. In many respects they form a favored group. On them are expended the best efforts of the medical staff, the most generous use of the social workers' time and a veritable concentration of follow-up.

The method of keeping these patients under care varies with the institution. The administration of intensive therapy is accomplished either by hospitalization of the patient or by insuring his appearance in clinic three times a week during the existence of open lesions. The fact that these patients may, under suitable circumstances, be hospitalized without difficulty is ably demonstrated by the hospital which in a period of four months admitted all of the thirty-nine patients with a diagnosis of primary, secondary or congenital syphilis in an infectious

stage to the ward set aside for that purpose. Another hospital carrying forty-one* such patients over a period of two months admitted only ten to the house. Five of the remaining patients disappeared during the preliminary intensive course of treatment.

While the number of patients who lapse treatment during the acutely infectious stage is small, the loss to the individual who thus deprives himself of the benefits of early therapy is great. Moreover, the patient who disappears at this time is often of the irresponsible type and his activities frequently constitute a menace to the community.

The fate of the patient who lapses treatment at a later stage—after the preliminary intensive course of treatment—is little better. In one hospital the records of a group of forty-eight patients who appeared in five successive clinics were carefully studied. It was found that twenty-three of these patients had received some previous treatment either from a private physician or in another institution. With two exceptions these patients now show the signs of deterioration consistent with the lapse of therapy.

CASE ILLUSTRATION

A young Italian appeared in the Out-Patient Department of Hospital B on May 26, 1932, stating that he had been refused admission to Hospital A during the previous week. Hospital A has no record of the patient, who may have used an alias. His diagnosis in the genito-urinary clinic at Hospital B was acute gonorrheal urethritis. On June 1 he was referred to the syphilis clinic with a positive dark-field. On June 2 the diagnosis of primary syphilis was confirmed. On June 4 he received his first treatment for syphilis, and in the meantime he had not returned to the genito-urinary clinic. Social investigation had been delayed eight days—first, because there is no social worker in the genito-urinary clinic, and secondly, because the patient was twice allowed to pass through the syphilis clinic without being referred to Social Service.

Young Married Couples

The problem of keeping young married couples under treatment is also extensive. The tendency is toward regular attendance in the early weeks of infection with a gradual falling off, first of the husband and then of the wife. Generally speaking, community resources are utilized in the effort to keep these patients under treatment, but frequently with rather poor results. Part of the failure is due to the delay in referring to an outside agency for assistance and part of the policy of assuming on insufficient grounds that the patient is under care elsewhere.

CASE ILLUSTRATION

In May of 1931, a 26 year old male American reported to a local clinic with tertiary syphilis. At the same time his wife was found to have secondary syphilis. In June they came fairly regularly for treatment. In July, the husband requested to be transferred to an evening clinic. This was accomplished by letter. The wife appeared in the clinic with increasing irregularity. Finally in November, it was discovered that the husband had never reported to the second hospital and in December efforts to locate this couple were futile.

*See Case Records in Appendix.

The Young Unmarried Promiscuous Girl

The general difficulty experienced by clinic workers in keeping the young unmarried promiscuous girl under treatment is also extensive. It may be said that this group is numerically unimportant in the local syphilis clinics, yet because of the causative environmental factors and obvious health hazards each case represents a problem of some magnitude. In many instances by the time these patients seek medical assistance through the clinics and thus come within the reach of a reconditioning force they have developed a remarkable ability to evade and a tendency to ignore ethical standards which might safeguard others from infection.

CASE ILLUSTRATIONS

1. A young woman, 24 years old, who cheerfully admits many sex experiences, has been under the care of a clinic since October, 1930. At that time she showed infectious secondary lesions. In spite of repeated efforts at follow-up, including five letters, she had on February 1, 1932, received only fourteen treatments.

2. The second patient represents an even more serious situation for in spite of intensive treatment during a hospitalization period of ten days, she was next seen a month later showing a recurring secondary rash and discussing the resumption of her old sex activities. During a period of one year she has been seen in the clinic but twelve times. Follow-up has included ten letters and she was finally referred to the Board of Health.

3. The third patient was eighteen years old, with a long record of delinquency, when she was hospitalized for seven days with a diagnosis of secondary syphilis. From April 7, 1931 to February 1, 1932, she has made fifteen clinic visits, and this has only been accomplished by the combined efforts of social service and the Board of Health.

It is fortunate when patients in this group are seen in the clinic with an early infectious lesion and are admitted for hospital treatment. While the object of this policy is community protection, it also provides an excellent opportunity for the medical social worker. One hospital has adopted the plan of having the clinic worker spend some time with the ward patients, a procedure which has already shown good results.

Follow-Up and Contact Examination

The workers dealing with syphilis and gonorrhea have two common problems, (1) the long-time care and supervision of the individual patient and (2) the search for contacts and sources of infection. That these patients may be kept under care is shown by the accomplish-

ment with the infectious groups already referred to and by the records of two smaller clinics that rarely lost a case.

The fact that patients with tertiary syphilis frequently lapse and that those with congenital syphilis rarely receive adequate treatment indicates a less effective type of follow-up.

I. Follow-Up of Individual Patient

One hundred consecutive patients at one clinic were interviewed to determine reasons for irregular clinic attendance. This group was composed of patients who had lapsed for two months and those who in the past six months had been frequently absent. The findings may be grouped as follows:

1. Thirty per cent cited financial difficulties, involving a lack of carfare, admission and treatment fees, or adequate clothing.
2. Twenty per cent gave certain practical barriers as their reason for non-attendance. These barriers included (1) no suitable arrangements for small children to be left at home; (2) danger of losing job if absent one day each week; (3) poor transportation facilities.
3. Twenty per cent gave as their reason certain obstacles based on clinic management, such as (1) delays in receiving treatment; (2) being interviewed by a different doctor each week; and (3) repeating personal history to several workers.
4. Personal objections were cited by fifteen per cent of these lapsed cases. Such objections included (1) dread of pain associated with treatment; (2) reaction following injection; (3) conflict over length of time treated; (4) unwillingness to expose the source of infection or contact; (5) anxiety lest the mate should discover the diagnosis.
5. The remaining fifteen per cent were influenced by misunderstandings regarding their treatment. Some were convinced that permanent cure followed the termination of pregnancy; some believed that a negative Wassermann indicated recovery; and some were afraid that the diagnosis would be given to their employers.

It was felt that ninety per cent of all these patients honestly interpreted their feelings and that the remainder seized upon and offered the most obvious excuse.

II. Search for Contacts and Sources of Infection

The examination of contacts and sources of infection is rarely complete. The siblings and parents of the child with congenital syphilis, the marital partner of the patient with tertiary syphilis and the children of those known to have late syphilis all too seldom benefit by the search for familial infection. That this search may be most complete is strikingly illustrated by the clinic which year after year succeeds in examining entire family groups. In the case of extramarital infections the difficulties are enhanced. Patients frequently claim intoxication at the time of exposure; insist that they are unable to give identifying data; deny contact or state that the person responsible resides in another state or country.

Thus the entire problem frequently remains unsolved.

One of the most serious defects in the follow-up system is the tendency to close cases without fixing responsibility for follow-up. In many cases it was found that records were closed and follow-up automatically ceased when preliminary arrangements were made for a patient to receive treatment in another institution without any attempt to learn whether the patient eventually reported there. In other cases the patient's statement that he was under care elsewhere was accepted without any investigation or attempt at verification.

CASE ILLUSTRATIONS

A mother and her baby were both under treatment for syphilis in a local clinic for two years. Attendance became irregular and finally ceased. A home visit was made and the patient who was six months pregnant, stated that she had transferred to another hospital. This statement was accepted without investigation and the case closed. Three months later, at the termination of pregnancy, it was discovered that the patient had made only one visit to that prenatal clinic, had not been referred to the syphilis clinic and the congenital child had been without treatment for several months.

The second child in a family of six received treatment for congenital syphilis in a local hospital over a period of two years. During this time apparently no attempt was made to secure examination for the parents or siblings. When this patient who came irregularly for treatment developed interstitial keratitis, it was decided to check other members in the family. The mother was found to have tertiary syphilis. The oldest child and the one immediately younger than the original patient both had congenital syphilis.

RELATIONSHIPS

It has been previously suggested that the relationship between certain departments is weak. It may be definitely stated that in certain institutions there is apparently no connection between the obstetrical and syphilis services or between the genito-urinary department and the department of syphilology, or between the divisions of pediatrics and syphilis. This obviously constitutes a disadvantage for the patient requiring the joint care of two services.

The failure to secure a successful combination of effort is even more apparent for the patient requiring inter-agency activity. The referring agency is frequently responsible for the most ineffective type of steering. The institutions often fail to utilize community resources and the general tendency is toward delay in asking for assistance in follow-up. Many instances were noted in which patients supposedly receiving an active course of treatment had

been absent for six months, with or without any follow-up by the clinic, before they were finally referred to the State Department of Public Health.*

It might be readily expected that this vague division of responsibility in coöperative cases would lead to discord. This was not the case. Only on two matters was there frank disagreement. Certain of the clinic personnel felt that the visiting nurse was unduly concerned with the problem of familial contact examination. This difference of opinion might be expected with the nurse constantly seeing the total family health situation and the clinic worker usually working with the individual patient.

On the other hand, the nursing staff took exception to certain methods employed in follow-up. They felt that the assistance they could render in returning lapsed patients for treatment would be more valuable if these lapses were reported promptly. The nurses also asked to be notified when patients under their care were to be reported to the State Department of Health. In an effort to solve these and other problems the following plan was worked out during the study:

I. To obviate delays by the prompt exchange of pertinent information. Patients being referred to the Syphilis Clinic by the Community Health Association to be accompanied or preceded by a letter of reference and the social worker to send out as soon as possible recommendations for the patient's care.

II. To keep open invariably in the Community Health Association the records of patients requiring treatment during pregnancy until they return to the Syphilis Clinic following the postpartum period.

III. To assume that the infants in these families will require examination; this to be delayed until the baby is six weeks old, unless there are obvious indications of infection during this interval.

IV. To base any attempt to secure examinations for other members in the family on the recommendation of the clinic physician. Significant observation of unexamined parents, mates or siblings to be conveyed to the clinic worker.

V. To conserve community resources by discussing with the Community Health Association any case active in that organization before referring it to the State Department of Health for follow-up. The nurse often knows of home situations which have interfered with the patient's attendance at clinic.

*See Regulation No. 4 Massachusetts Department of Public Health. Regulations Governing the Reporting of Gonorrhea and Syphilis.

Summary of Findings

I. Adverse Findings

A. *Overcrowding of the larger clinics, causing*

1. Delays in all clinic functions to the eventual disappearance of many patients.
2. Unsatisfactory first contacts, leaving the patient uninformed as to what is expected of him and resulting in serious delay in contact follow-up.
3. Failure to interpret pertinent facts to the individual patient.
4. The occasional nonrecognition of serious health and social situations.
5. Repeated minor errors: loss of blood test or spinal fluid report, etc.
6. The inability to give personal attention to the individual.

B. *Insufficient number of workers in certain social service and follow-up departments, resulting in*

1. Unsatisfactory handling of certain difficult cases.
2. Delayed reference to other agencies.
3. Delayed reports of findings to the referring agency.
4. Poor use of community resources.

C. *Undetermined relationships within the institution contributing to*

1. Failure to make interdepartmental "refer".
   a. from the Prenatal Clinic to the Syphilis Clinic,
   b. from the Genito-urinary Clinic to the Syphilis Clinic,
   c. from the Pediatric Clinic to the Syphilis Clinic.
2. Delayed reference to social service.

D. *Undefined agency relationships contributing to*

1. Ineffectual follow-up.
2. Premature closing of cases.
3. Confusion and conflict in the handling of certain cases.
4. Unproductive expenditure of time and effort.

E. *Nonrecognition of the familial aspects of syphilis in the larger clinics, as shown by*

1. Repeated failures to secure examinations of mates.
2. The comparatively rare follow-up of siblings and parents for the congenital case.

3. The small number of infants examined, following those pregnancies in which the mother was known to have syphilis.

II. Favorable Findings

A. *Common contribution made by every clinic and agency covered by this study:*

A concentration of effort to

1. Keep the acutely infectious under care.
2. Secure examination for alleged contacts and sources of infection for the patient who is infectious.
3. Protect every patient from any unnecessary publicity relating to his condition.

B. *Special Contributions*

1. Hospitalization for intensive treatment of patients who are infectious:
   The Massachusetts General Hospital
2. Routine examination of familial contacts:
   The Boston Psychopathic Hospital
3. Case holding until patient is under care in another institution:
   The Beth Israel Hospital
   The Boston Psychopathic Hospital
4. Efficient clinic management in the handling of large groups:
   The Boston City Hospital
5. Extension of social service to include every patient:
   The Eye and Ear Infirmary
6. Well-organized administrative functions especially in the field of follow-up:
   The Boston Dispensary
7. Consistent treatment and the provision of educational facilities for children with vulvovaginitis:
   The Long Island Hospital

General Recommendations

In consideration of these findings and with due regard to the difficulties of management which face the larger clinics and the financial pressure now experienced by every agency and institution, the following suggestions are made:

I. More adequate follow-up for entire clinic load, under the direction of social service.

II. Increased effectiveness in the use of community resources for follow-up—

A. By the prompt referring of lapsed cases.

B. By a better system for the exchange of information between clinic and field agency.

III. The value of the service to the individual patient be increased—

A. By suitable steering from the field agency.

B. By better management in the first clinic visit.

IV. Since the policy of closing cases without determining the responsibility for follow-up is responsible for a large number of lapsed cases, it is suggested that the referring clinic or agency keep the responsibility for the patient until he is actually under care in another institution.

V. A small percentage of the total number of patients covered by this study became intensive social cases. It is felt that arrangements should be made for "intensive social treatment" of a larger portion of the serious social problems presented by these individuals.

VI. In view of the unsatisfactory findings in the prenatal group it is imperative that the prevention of congenital syphilis be accepted more seriously by the prenatal clinics, the public health and social agencies and by the clinics giving antisyphilitic treatment.

VII. In the interests of efficiency and for the welfare of the individual patient, it is urged that the clinics make some arrangement whereby the syphilitic patient has the opportunity of being interviewed by the same physician at regular intervals.

VIII. The delays caused by the overcrowding of the Saturday morning skin clinics are largely responsible for the difficulties experienced in keeping the congenital child under care. Some special arrangement is indicated for this group.

Appendix

Patients with primary and secondary syphilis admitted to clinic during two months' period:

1. Secondary—30 years old—male—married, unemployed. Patient came regularly to clinic. Received nine treatments in five weeks. Source of infection not known. Contact—wife, came in with secondary lesions.
2. Secondary—27 years old—female—married. Housewife. Patient pregnant at term. Seen April 2 and 5. Husband under treatment at another hospital for one year. Children not examined.
3. Secondary—29 years old—male—single. Unemployed. Patient came regularly to clinic. Received 12 treatments in six weeks. Source of infection not known.
4. Secondary—34 years old—female—single. Unemployed. Patient referred to House for intensive treatment April 5. Returned to skin clinic May 31. Source of infection not known.
5. Primary—25 years old—male—single. Unemployed. Patient came regularly to clinic. Received ten treatments in six weeks. Source of infection not known.

6. Secondary—12 years old—male—single. School. Received intensive treatment in the House. Source of infection brought under treatment by S. P. C. C.
7. Secondary—14 years old—female—single. School. Referred from other hospital. Source of infection not known. Sister who slept with patient examined and found to be negative.
8. Primary—29 years old—male—separated from wife. Taxi-driver. Patient made only two clinic visits, on April 7 and 26. Referred to Board of Health. Not located. Source of infection not known.
9. Secondary—50 years old—female—divorced. Unemployed. Patient came regularly to clinic. Received seven treatments in five weeks. Denied exposure.
10. Primary—33 years old—male—married. Unemployed. Patient came regularly to clinic. Received eleven treatments in seven weeks. Source of infection not known. Wife not examined.
11. Primary—34 years old—male—single. Laborer. Patient received four treatments in two weeks. Missed two weeks and returned by follow-up. Source of infection not known.
12. Primary—25 years old—male—single. Lather. Patient came regularly to clinic. Received seven treatments in five weeks. Source of infection not known.
13. Secondary—35 years old—female—divorced. Unemployed. Patient came regularly to clinic. Received eight treatments in four weeks. Contact now under care. Source of infection not known.
14. Secondary—40 years old—female—separated. General work. Patient came very irregularly to clinic. Received only three treatments in four weeks. Husband, supposed to be source of infection, has deserted. Seven children in the family not examined. On probation and followed by S. P. C. C.
15. Primary—30 years old—male—single. General work. Patient came regularly to clinic. Received eight treatments in four weeks. Source of infection unknown.
16. Primary—23 years old—male—single. Unemployed. Patient came fairly regularly to clinic. Arrested for larceny and sent to prison while still infectious. Prison authorities notified. Source of infection not known.
17. Secondary—30 years old—male—single. Salesman. Patient came very regularly to clinic. Received eight treatments in four weeks. Lapsed on May 12. Reported to Board of Health. Source of infection not known.
18. Secondary—24 years old—female—deserted. Housewife. Patient received intensive treatment in the House during infectious period. Source of infection unknown, husband not located.
19. Secondary — 21 years old — female — separated. Housewife. Patient came regularly to clinic. Received intensive treatment in the House. Infected by husband who has deserted,—whereabouts unknown. Two year old baby examined and found to be negative.
20. Secondary—21 years old—male—single. Unemployed. Patient received intensive treatment in the House during infectious stage. Source of infection out of town.
21. Secondary—23 years old—male—single. Unemployed. Patient known to Throat Clinic and G. U. Clinic for one year. Probably secondary during part of that time. Anal lesions noted eight months previously. Sent to Tewksbury for treatment. Admitted many perversions.
22. Primary—30 years old—male—single. Truck driver. Patient came regularly to clinic. Received eight treatments in four weeks. Admitted many exposures.
23. Primary—27 years old—male—married. Unemployed. Patient admitted to House for intensive treatment following an attack of infectious arthritis. Infected by his wife, who is now under treatment. Child negative.
24. Primary—29 years old—male—single. Unemployed. Patient came regularly to clinic. Received eight treatments in four weeks. Source of infection not known.
25. Primary—21 years old—male—single. Unemployed. Patient came regularly to clinic. Received six treatments in 14 days. Not seen in clinic after May 21. Source of infection not known.
26. Primary—23 years old—male—single. Unemployed. Patient came regularly to clinic. Received ten treatments in May. Source of infection not located.
27. Primary—34 years old—male—single. Unemployed. Patient came regularly to clinic. Received six treatments in two weeks. Source of infection not located.
28. Primary—15 years old—female—single. School. Patient made only two clinic visits. Reported to private doctor for treatment. Alleged contact examined and found negative. Patient had chancre of upper lip.
29. Primary—28 years old—male—single. Unemployed. Patient came regularly to clinic. Received four treatments in two weeks. Transferred to private doctor for care. Source of infection in Florida.
30. Primary—51 years old—male—single. General work. Patient came regularly to clinic. Received six treatments in two weeks. Gave name of source of infection, who could not be located by Board of Health.
31. Primary—31 years old—male—single. Laborer. Patient came regularly to clinic during infectious stage. Gave address of source of infection—did not know name. Not located by Board of Health.
32. Secondary—26 years old—male—single. Porter. Patient made only three visits to clinic. Last seen May 28. Reported to Board of Health. Denies exposure.
33. Secondary — 23 years old — female — married. Housewife. Patient came regularly to clinic. Received seven treatments in three weeks. Infected by husband, who is also under care.
34. Secondary—34 years old—male—single. Unemployed. Patient admitted to House for intensive treatment. Lesions in mouth and on tonsil. Source of infection not known. Probably many contacts.
35. Secondary — 38 years old — female — married. Housewife. Patient came regularly to clinic. Probably infected by husband, who is also a secondary. She is the mother of five children who will be examined later.
36. Secondary—37 years old—male—married. Unemployed. Patient came regularly to clinic during infectious stage. Source of infection not known—wife contact.
37. Secondary—29 years old—male—single. Unemployed. Patient came very irregularly to clinic. Received only three treatments in seventeen days. Source of infection out of town.

38. Secondary—56 years old—male—single. Unemployed. Patient first seen May 12, second visit May 26. Infectious secondary during that time. Promised to bring in source of infection but failed to do so.

39. Primary—26 years old—male—single. Unemployed. Patient comes regularly to clinic. Source of infection not known.

40. Secondary—20 years old—male—single. Unemployed. Patient comes regularly to clinic. Received seven treatments in three weeks. Failed to bring in source of infection.

41. Secondary—16 years old—female—single. School. Patient lapsed treatment for fourteen days after first visit. Coming regularly after second visit. Source of infection unknown. Followed by Probation Officer.

PERNOCTON* HYPNOSIS IN OBSTETRICS

With a Report of 103 Cases

BY MARIO A. CASTALLO, M.D.†

THE problem of the relief of pain in childbirth is by no means new, for since time immemorial attempts have been made to alleviate the pain attendant upon the birth of a child. We may hark back to the Bible for a reference, where it is written that a deep sleep came over Adam before the removal of that famous rib. Inscriptions and drawings from old Egyptian times reveal the fact that crude and unscientific methods were in vogue for the relief of the parturient woman. In medieval times incantations were used to expedite the coming of the child, and to make the trials of labor easier for the woman, while during the Renaissance certain drugs were used, which, when brewed, caused vapors to permeate the rooms, with the idea of giving the patient some relief; the efficiency of which is doubted greatly.

Not until Morton discovered ether in 1846 did modern anesthesia come into the field of the relief of pain in obstetrics. Close upon the discovery of Morton came the use of chloroform, and labor "a la Reine" through the discovery of Simpson. In 1880, Klikowitch, of St. Petersburg, experimented with a mixture of nitrous oxide and oxygen, which has come into general use as an anesthetic agent and a valuable adjunct for the relief of pain in labor.

Since labor is a physiologic process which usually requires a number of hours for the accomplishment of its purpose, and the agents so far mentioned are useful only during the very last part of labor, our problem has been to relieve the parturient woman for a longer period of time. To that end morphine sulphate, either alone or combined with scopolamine or magnesium sulphate, has been employed with some degree of success. The use of rectal ether with the synergistic action of magnesium sulphate which Gwathmey perfected at the New York Lying-In Hospital is again an improvement. Lately the barbiturates have been added to the list of drugs which we may use for the relief of the pain incident to labor. The barbiturates have been used intravenously, and by mouth. Lately they have been combined with ether and oil as suggested by Gwathmey and used per rectum, which last mentioned method is being employed at the Philadelphia Lying-In Hospital[10], a preliminary report of which is most gratifying, while at the Boston Lying-In Hospital sodium amytal and scopolamine have given good results[13].

The barbiturates are derived from urea and malonic acid, which, combined, form barbituric acid and by the addition of and substitution for different radicals in the chemical chain, there are obtained such substances as Veronal, Amytal, Allonal, Ipral, Neonal, Luminal, Pernocton, etc.

Thus urea $CO\begin{Bmatrix}NH_2\\NH_2\end{Bmatrix}$ and malonic acid $\left.\begin{matrix}OH\cdots O\\OH\cdots O\end{matrix}\right\}C\begin{Bmatrix}H\\H\end{Bmatrix}$ form barbituric acid.

$$CO\left\{\begin{matrix}NH\cdots CO\\OH\cdots CO\end{matrix}\right\}C\begin{Bmatrix}H\\H\end{Bmatrix}$$

By the addition of two ethyl radicals to this compound there is formed di-ethyl barbituric acid or barbital with the trade name veronal.

$$CO\left\{\begin{matrix}NH\cdots CO\\OH\cdots CO\end{matrix}\right\}C\begin{Bmatrix}C_2H_5\\C_2H_5\end{Bmatrix}$$

Amytal is formed by the substitution of an iso-amyl group for one of the ethyl groups.

$$\text{Amytal}\quad CO\left\{\begin{matrix}NH\cdots CO\\NH\cdots CO\end{matrix}\right\}C\begin{Bmatrix}C_2H_5\\C_5H_{11}\end{Bmatrix}$$

Pernocton is formed by replacing the ethyl group with a secondary butyl radical, and the iso-amyl group by the beta brom allyl radical.

$$\text{Pernocton}\quad CO\left\{\begin{matrix}NH\cdots CO\\\\NH\cdots CO\end{matrix}\right\}C\left\{\begin{matrix}C\begin{Bmatrix}C_2H_5\\H\\CH_3\end{Bmatrix}\\\\CH_2\cdots C\text{-}Br=\!=\!=CH_2\end{matrix}\right.$$

This is all much easier to say than to do[12].

The addition of asymmetric groups such as the secondary butyl radical has been found both

*Since this writing, June 1932, "Pernocton" was changed to "Pernoston," to comply with the Committee on New and Non-Official Remedies of the American Medical Association.

†Castallo—Clinical Assistant in Obstetrics, Jefferson Medical College Hospital. For record and address of author see "This Week's Issue," page 758.

to intensify and to accelerate the hypnotic action.

Pernocton is marketed as a ten per cent aqueous solution of the sodium salt of the secondary butyl-beta-bromallyl barbituric acid. Bumm[3] of Berlin originally investigated this drug in 1926 and 1927. Dogs were used as the subject of his animal experimentations. The minimum lethal dose was found to be ten times the minimum effective dose, leaving a rather generous margin of safety. Clinically he believed the intravenous route to be the method of choice. His average dose was 0.7 to 0.8 mg. per kilogram of body weight (corresponding to 4 to 6 cc. of the 10 per cent solution), supplemented with ether. This was preceded with morphine and atropine. He reported that the respirations were quiet and of the same depth and rate. Blood pressure dropped from five to ten points and the pulse was not affected. The patients were under its influence for twenty-four hours and one-third of them showed postoperative restlessness. There was no nausea or vomiting. Urinalysis revealed no evidence of renal or hepatic damage. Bumm then concluded that Pernocton possessed distinct advantages over other drugs thus far developed for the production of anesthesia in surgery. Goldschmidt[7], Goetz[6], Hole[8], and Wolfgang Schmidt[14], following Bumm's work in surgery employed Pernocton in obstetrics with very gratifying results. They used doses varying from 3 to 7.5 cc. depending upon the weight of the individuals, repeated doses, from 1 to 2 cc. up to two doses, were given. A large percentage had ideal amnesia. Restlessness was reported in from 10 to 25 per cent of cases.

The use of Pernocton in this country for obstetrics we believe was introduced at The Sloane Hospital for Women, New York City, in a paper presented before the New York Academy of Medicine in December 1930, by Brown, Moloy and Laird[1], in which were reported 133 cases. At that time they were unable to find any reports of work being done in this country. Since the publication of that paper there have appeared in the English literature a dozen or more papers on Pernocton, mostly by anesthetists, in the field of general anesthesia and the use of the drug in the preanesthetic field.

PHARMACOLOGIC ACTION OF PERNOCTON

Pernocton in the body is first transformed into acetonyl barbituric acid, and then into other substances which are inert and practically nontoxic. It has not been possible to trace Pernocton in the urine, but only the transformation products in a quantity which corresponds to about 1/8 the amount of the drug administered. Its effect varies with the amount given, but generally it may be said to be the most powerful hypnotic that we have available at the present time, having over twice the strength of sodium amytal. McKesson and McCarthy report Pernocton to have about twice the hypnotic action of sodium amytal. They used nine grains of Amytal to gain the same degree of unconsciousness that they could obtain with 4½ grains of Pernocton, and conclude that there was less restlessness and excitement during the recovery period, no marked fall in blood pressure, a more powerful hypnotic effect, a smaller volume to be injected, a shorter period of unconsciousness, and better and earlier coöperation during the recovery phase[12].

The intravenous route is used for the administration of Pernocton. The patient comes under the effect of the drug without excitement and with rapidity. Within a very short period the reaction time is prolonged and the patient rouses herself with more and more difficulty to answer questions. Consciousness is lost so rapidly that there are usually no psychic or emotional disturbances associated with the induction. Inside of three minutes the patient is usually asleep but can be roused by painful stimuli, and the ordinary reflexes persist. The sleep resembles very closely normal sleep, no change is noted in the pulse rate, and very little change in the blood pressure; respirations are a bit slower than normal but with somewhat greater amplitude. The patient will awaken with a pain and sometimes cry out, and move from side to side. Perception to all stimuli is dulled and upon complete recovery there is usually no recollection of events that have transpired during this time. Occasionally patients show peculiar clonic muscular contractions; this appeared more frequently in the beginning of our use of the drug, which was attributed to the too rapid injection of the Pernocton into the blood stream. No after effects were noted. The effect of the hypnosis is about twice the length of the unconsciousness.

With Pernocton we endeavor to carry the patient from consciousness to semiconsciousness and hypnosis and no further, quite unlike ether or nitrous oxide where we carry the patient from consciousness down through semiconsciousness and hypnosis to the various levels of anesthesia (fig. 1). When Pernocton has been administered the patient is already in a hypnotic state, and nitrous oxide or ether is used only to produce the deeper stages of surgical anesthesia[11], as in our series of cases, where the latter anesthetic agents were employed for the birth of the head over the perineum, and for surgical interference. The Ritgen manoeuvre is employed as soon as the chin may be grasped through the perineum, and under surgical anesthesia the birth of the child is consummated at the discretion of the operator. The question of how long Pernocton remains in the system is answered by the exhaustive work of Boedecker

and Ludwig[2]. They found that the products of iso-propyl-bromallyl barbituric acid are decomposed rapidly and almost completely in the circulation. The barbituric acids of Pernocton are broken up into acetonyl barbituric acids which may be transferred to malonylureic acetic acid. They gave these compounds to animals, but could not produce any hypnotic effect, hence they observed that the action of Pernocton passes off quickly, i.e., in from two to five hours.

ADMINISTRATION

In our series of cases the Pernocton was given when the labor pains were occurring two or three minutes apart and the cervix was dilated three fingers or more. Bumm used about 1 cc. per 30 pounds of body weight. Our average dose was about 4 cc. The room is darkened and the patient is told what is about to be done and the results which will be attained if she is coöperative. Her eyes are covered with a towel,

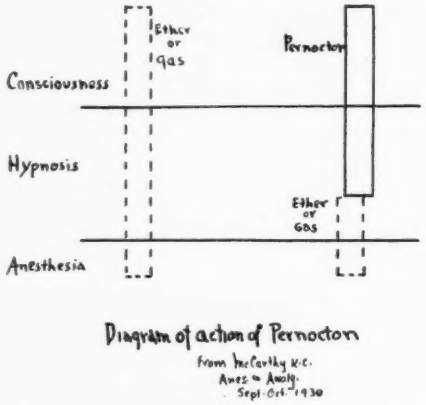


FIGURE 1. Diagram of action of Pernocton. From McCarthy, K. C., Anes. & Analg., Sept.-Oct., 1930.

and cotton is placed in her ears. A tourniquet is placed about her arm. (We used the arm band of a sphygmomanometer for this purpose during the first few hundred cases at the Sloane Hospital to record the fall of blood pressure, which we found in most cases did not drop more than 10 mm. of mercury.)

The median basilic vein is brought into prominence and during a pain, after the usual preparation of the arm with alcohol and iodine, the needle of the sterile syringe containing the Pernocton solution is inserted into the vein and the plunger of the syringe is drawn back to ascertain that we are in the vein, and the injection of the solution is commenced. By means of a watch we gauge the amount of flow, for the solution should not enter the blood stream faster than 1 cc. per minute and even slower. It was found that if 1 cc. is injected only every one and one-half minutes the results are very much better. The reason for the slowness of the injection lies in the fact that the Pernocton solution has a PH of 9.8[9], while that of the blood stream is PH 7.3; and if this solution were thrown into the blood stream at a greater rate of speed there would be evidences of toxic symptoms due to the precipitation of barbituric acid. The patient usually falls asleep within three minutes and may become restless and move about with the pains.

It has been said that if some of the solution is injected inadvertently into the soft tissues there is the probability that a slough would form but we have never noticed this reaction following such an occurrence. Since the Pernocton is injected intravenously its excretion is rapid, and thus to prolong its action we found that, if it were injected intravenously only until the patient fell asleep and the remainder injected intramuscularly, its action was materially increased. This method was employed by us during the last 20 or 25 per cent of our cases with gratifying results. We believe that the combined intravenous and intramuscular method of administration has distinct advantages and advocate this method of application for a much more prolonged action. The Pernocton may be repeated if necessary, and it is hardly ever used in more than 2 cc. dosage in these instances, which gives good results[5]. The repeated dose is seldom necessary before two or more hours have elapsed. It is imperative that there is an attendant present when the patient is under the influence of Pernocton.

Between contractions she seems under a normal sleep and may move from side to side or become restless when a pain is in progress, only to fall back into a sleep. The labor pains may or may not be affected so that there is a lull in the progress of labor, but after the initial momentary lull the contractions usually become more severe and the labor progresses with greater rapidity. The patient will usually work well with the contractions of the uterus and more than half of the patients will obey commands. All of them had a general anesthetic at the perineal stage, as it is our custom to deliver all patients in this manner. It was found that only a small amount of a general anesthetic is needed to accomplish this end, and for any repair work which is needed the amount of anesthetic was very much reduced. A very large percentage did not remember anything after the injection of the Pernocton, whether they were restless or not. On the whole the results obtained were most satisfactory from the patient's point of view.

CONTRAINDICATIONS

Pernocton should not be used in cases of moderate or severe kidney damage, nor if there is any impairment of the liver function. Some speak of a contraindication to the use of Pernocton because of its effect on respiration in bronchitis, etc. In our obstetric group we did not find that there was any marked change in the respiration rate or in the depth, to be worthy of any comment; perhaps due to the pain

stimulus present. It is our belief that Pernocton should not be used in those cases which are having tumultuous contractions, with consequent embarrassment of the child, evidenced by great changes in the fetal heart rate.

REPORT OF CASES

Since the first 133 cases of Pernocton analgesia reported by Brown, Moloy and Laird, in December, 1930, there have been delivered at the Sloane Hospital under Pernocton over 700 cases. The cases herewith presented are from

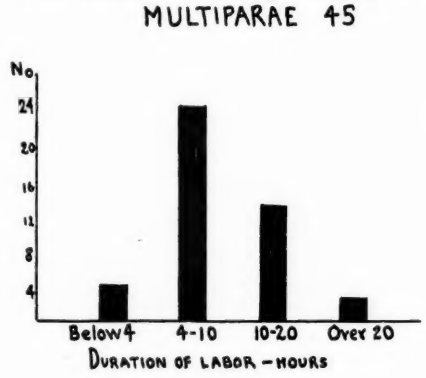


FIGURE 2.

that series, and were under my care while day and night senior house officer in that institution. I am indebted to Dr. B. P. Watson and Dr. W. C. Caldwell for placing these cases at my disposal.

In our series of 103 cases, there were 45 multiparae, and 58 primiparae. Of the multiparae, five were in labor less than four hours, 24 were in labor between four and ten hours, 13 between 10 and 20 hours and three were in labor over 20 hours; the youngest in this group was 18 and the oldest 38 (fig. 2). In the group of primip-

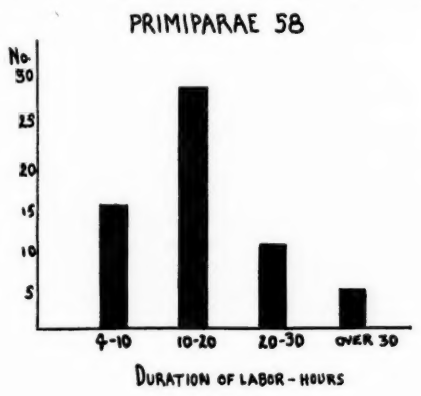


FIGURE 3.

arae 15 were in labor between four and ten hours, 28 between 10 and 20 hours, 10 between 20 and 30 hours, and five were in labor over 30 hours. The youngest was 17 and the oldest 35 (fig. 3). Our results were one failure, five poor, five fair, eight were found to be restless, but had good amnesia; three were restless but had a good result following, in each instance, two cc. of magnesium sulphate, 4 cc. of Pernocton, and the other 2 cc. of Pernocton (fig. 4). In both instances the Pernocton was injected intramuscularly. Eight of the women required medica-

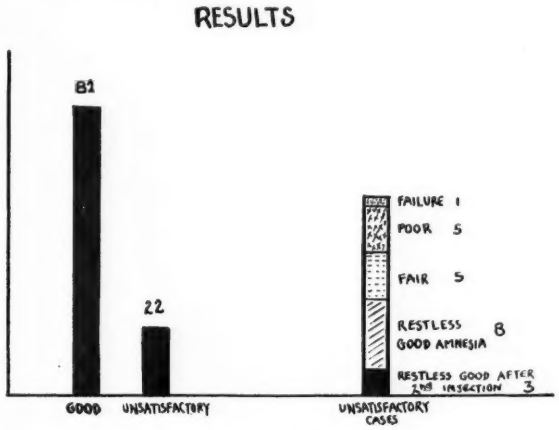


FIGURE 4.

tion after the injection of the Pernocton. Three were administered rectal ether and five received magnesium sulphate, three because of restlessness and two for its synergistic effect (fig. 5). There was one postpartum hemor-

PREPERNOCTON MEDICATION

M. S. & MgSO4	8	Nembutal	1
M. S. & Scop.	7	M. S. & MgSO4 M. S. & Scop.	2
M. S.	2	M. S. & Scop. Chloral Hydrate	1
Gwathmey	1	Total	24
Allonal	2		

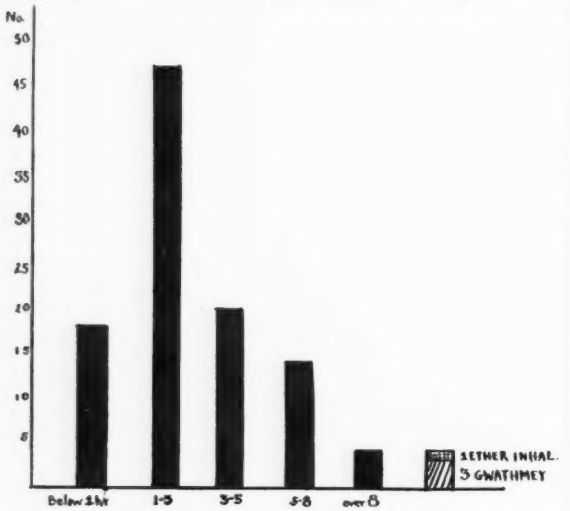
POSTPERNOCTON MEDICATION

Gwathmey Technic	3
MgSO4	
Restless	3
Synergistic	2
Total	8

FIGURE 5.

rhage, in which case the uterus oozed for three hours in spite of treatment. This patient had a blood transfusion. She had received 4 cc. of Pernocton intravenously as a primary injection, followed in one hour by 2 cc. intravenously, and then 2 cc. intramuscularly one hour and 40 minutes later. Whether the Pernocton had anything to do with the hemorrhage is problematic. In all the cases there were 24 who received some medication prior to the use of Pernocton; eight received morphine sulphate and magnesium sulphate alone; one Gwathmey analgesia, two allonal, one nembutal, two both morphine sulphate and magnesium sulphate and morphine sulphate and scopolamine and one had morphine sulphate and morphine scopolamine twice and chloral hydrate gr. xxx (fig. 5). Twenty-three received intramuscular injections of Pernocton ranging from 1 cc. to 4 cc. (fig. 11). It was found that

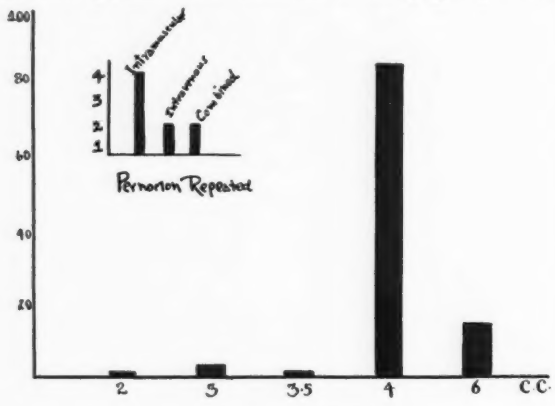
the time of delivery following Pernocton occurred in most instances between five and eight hours after Pernocton administration, and four delivered over eight hours following the injection of Pernocton, and of these, three ended with rectal ether and one with ether inhalations (fig. 6). The amount of Pernocton injected in-



DELIVERY AFTER PERNOCTON IN HOURS

FIGURE 6.

travenously at one time fell into the 4 cc. group most frequently; 84 received this amount, 15 received 6 cc., two received 2 cc. and 3.5 cc. respectively, and two received 3 cc. (fig. 7). The

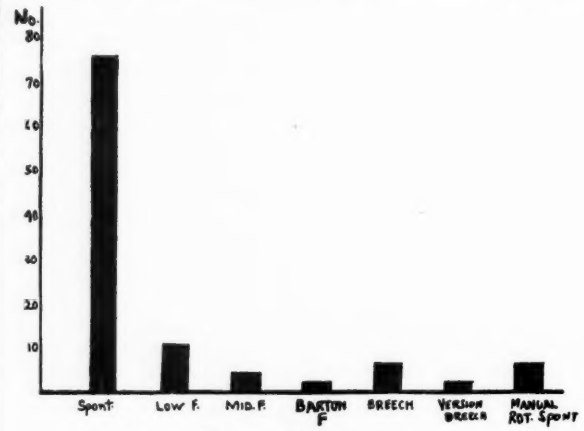


AMOUNT OF PERNOCTON INTRAVENOUSLY AT ONE INJECTION

FIGURE 7.

Pernocton was repeated in eight instances, four intramuscularly, two intravenously and two had a combination of both intravenous and intramuscular injections. The type of delivery compares favorably with the usual figures; 75 delivered spontaneously, ten low forceps, four by mid-forceps, two by Barton forceps, six by breech extraction, two by version breech, and six cases by manual rotation of head with subsequent normal delivery (fig. 8).

The condition of the babies at birth seemed not to be very different from the usual cases. There was only one stillbirth, which was of a premature infant with the cord wound tightly about the leg; two were born with considerable mucus, but responded well to treatment. On the whole we do not feel that there were any cases in which the Pernocton either directly or indirectly jeopardized the child. In most of the cases the

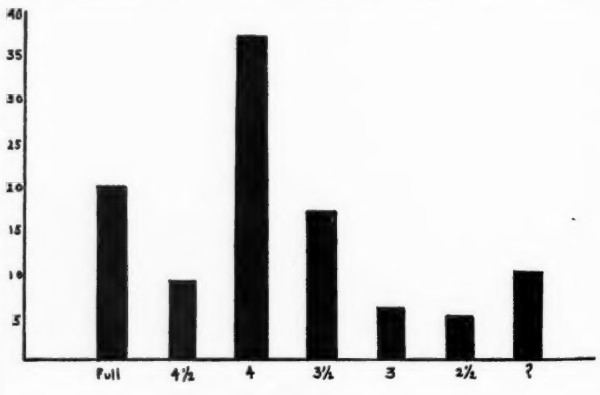


TYPE OF DELIVERY

FIGURE 8.

Pernocton was injected when the patient was well in labor.

There were 37 cases with the cervix four fingerbreadths dilated, 20 were fully dilated, nine had a dilatation of 4½ fingers, 16 were dilated 3½ fingerbreadths, six were dilated three fingers, five had a dilatation of 2½ fingers, and in ten cases the dilatation was not ascertained; in this last group may be placed those cases which were admitted with strong pains coming at frequent intervals, where it was deemed expedient to give the Pernocton without a vaginal examination, for we did not employ rectal examinations in this institution (fig. 9). The

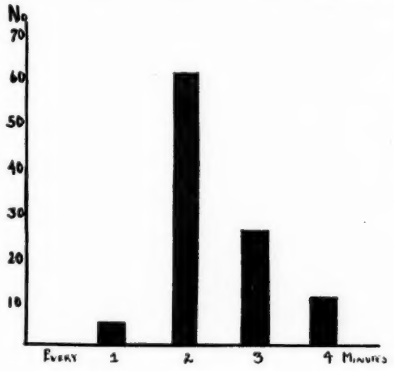


DILATATION OF CERVIX WHEN PERNOCTON INJECTED

FIGURE 9.

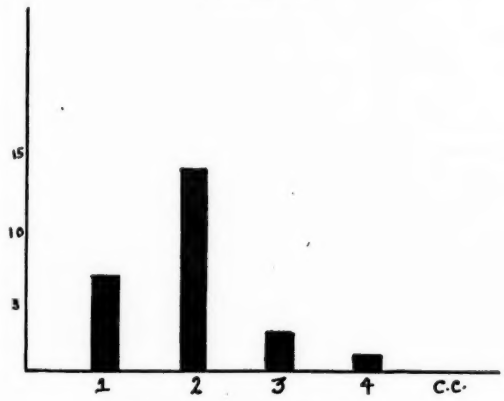
greatest number were having contractions every two minutes when the Pernocton was administered; in this group there were 61, in the group having three minute contractions there were 26, eleven were having pains every four minutes and five were in the group having contractions every five minutes (fig. 10). All of these cases received nitrous oxide ether or ether at the perineal stage. When perineal repairs were done, in

general it may be said that the amount of anesthetic needed was much less than usual. In the exceptional cases it was possible to repair slight lacerations without the aid of any other anesthetic agent, but this was seldom, for even if the patient did not remember the incident, the reaction to the painful stimulus and the ensuing movements detracted from the use of the proper technic, therefore in the greatest number of cases the additional anesthetic agent was employed.



CONTRACTIONS WHEN PERNOCTON INJECTED

FIGURE 10.



PERNOCTON INTRAMUSCULAR INJECTION

FIGURE 11.

SUMMARY

Pernocton was used in 103 cases in labor. Fifty-eight were primiparae and forty-five were multiparae. The usual dose was 4 cc., a comparatively few received 6 cc., and four received less than four cc.

The first injection was given in most cases when the cervix was dilated four or more fingerbreadths, and the pains were coming in most cases every two or three minutes.

The time of delivery following Pernocton was in most cases below three hours.

The drug was used intramuscularly in 23 cases, with some lengthening of the time of amnesia. It was necessary to repeat the Pernocton in eight cases, while in eight other cases the delivery was not completed after the injection of Pernocton before rectal ether had been employed in three cases and magnesium sulphate had been used in five of the other cases.

In 24 of the cases the Pernocton was administered after the use of some other drug.

The effect on the patient on the whole was favorable or apparently so, there being one failure and ten poor or fair results while 12 showed varying degrees of restlessness.

There were no maternal deaths in the series and only one stillbirth, which cannot be attributed to Pernocton, for the child was premature and had the cord tightly wound about its leg.

CONCLUSIONS

1. In Pernocton we have an analgesic agent which is to our mind a distinct advance in anesthesia in the obstetrical field.
2. In selected cases and in the proper hands Pernocton is an agent worthy of being exhibited to the parturient woman, for the relief of pain and the amnesia following its use are notable effects.
3. There is no tendency to the prolongation of labor and in many instances the labor is brought to a termination much sooner than is expected.
4. The untoward effect is the restlessness which is sometimes encountered and which may prove annoying, but this may more or less be controlled by the use of small doses of scopolamine or magnesium sulphate intramuscularly.
5. There is no real untoward effect on the child.
6. In ordinary dosage there is apparently no danger to the mother.
7. The combined intramuscular and intravenous injection of Pernocton seems to lengthen the hypnotic effect of the drug.
8. Pernocton is an agent which may be added to the list of drugs which are now in use for the relief of pain in labor.

We wish to thank Dr. Meyer Saklad for his aid and assistance in the making of the charts used in this paper.

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CASE RECORDS
of the
MASSACHUSETTS GENERAL HOSPITAL

ANTE MORTEM AND POST MORTEM RECORDS AS USED IN WEEKLY CLINICAL-PATHOLOGIC EXERCISES

EDITED BY RICHARD C. CABOT, M.D.
F. M. PAINTER, A.B., ASSISTANT EDITOR

CASE 19411*

PRECORDIAL PAIN LASTING HOURS

MEDICAL AND SURGICAL DEPARTMENTS

PRESENTATION OF CASE

DR. RICHARD B. CAPPS:** This is the case of a sixty-one year old white married shoe-worker who entered the hospital for the second time complaining of pain of ten years' duration in the chest and down the left arm on exertion.

First admission. Ten years before his second admission he first noticed dull, smothering precordial pain on exertion, on walking up hills or against the wind. This was relieved by rest. It gradually increased and was brought on by less and less exertion until seven years before admission, at which time it radiated down the left arm. About this time he had a series of attacks one night which lasted for a period of nine hours and were partially relieved by little white pills given him by his physician. The pain was much more severe than at any previous time. Following this he spent several weeks in bed. After he was up and about the paroxysmal pain continued with exertion and he also noticed a little more dyspnea than previously, and some gain in weight.

He had a past history of eight weeks' illness in bed with rheumatic fever when he was eighteen.

Three and a half years before admission he was admitted to the hospital in order to have an alcohol injection. At that time his heart findings were essentially as at the second admission. I will describe them later. The Hinton test was negative. An electrocardiogram showed slight left axis deviation with flat T_2 and inverted T_3.

Dr. James C. White did an alcohol injection of the first four dorsal ganglia on the left with good block and complete relief of the pain for a period of about a month that year, three and a half years before the second admission.

History of interval. A month or two later the patient began to have very mild attacks of pain again, but was still able to work until about a year before his second admission. At that time he had more severe attacks. Three and a half months before admission the pain became worse than it had ever been before. He had another severe attack lasting for nine hours and only partially relieved by nitroglycerin. After that time he led a chair and bed existence and had some attacks in bed.

Second admission, three years and five months after his first discharge. Physical examination on admission showed a well developed and nourished man sitting up in bed in no acute distress. The heart was slightly enlarged. All over the precordium he had a loud musical systolic murmur, loudest at the aortic area. The aortic second sound was not heard. There is no record as to whether he had a thrill or whether the murmur was transmitted to the neck, but as I remember it, it was transmitted to the neck. The blood pressure on the morning of admission in the Outpatient Cardiac Clinic was 160/80. At the admission examination it was 125/95, with a plateau pulse. That was thought to have some poor prognostic significance. The liver was two fingerbreadths below the costal margin, slightly tender. He had diminished sensation to pin prick over the left half of the body from the base of the neck to the level of the fourth interspace in front.

Laboratory work showed a white cell count of 8,200.

X-ray examination showed moderate enlargement of the heart, arteriosclerosis and some chronic passive congestion.

The temperature was normal.

During the first two days after admission he had attacks of pain while lying in bed, relieved by nitroglycerin. On the third day he complained suddenly of very severe pain in the epigastrium and the lower sternal region, broke out into a full sweat and became slightly cyanotic. He was given nitroglycerin in large amounts and amyl nitrite without any relief and became unconscious. While we were watching him he suddenly developed a very intense plum colored cyanosis on the top of his head which gradually worked its way down to his waist. During this time he was sweating profusely. The neck veins were very congested and the pulse could not be obtained. The respirations ceased gradually. After this wave of cyanosis, which took a minute or so to reach the waist, he gradually became pale again. The heart sounds became audible and he started to breathe. No blood pressure was obtained however. At this time one-half grain of morphia was given. A few minutes later another wave of cyanosis started. As it reached the region of his neck 3 cubic centimeters of coramine was given intravenously. This started the respirations temporarily, but apparently the pulse could not be obtained. This time as the attack of cyanosis gradually faded the heart sounds were not audible. He was given 2 cubic centimeters more of coramine without effect and fifteen minims of adrenalin into his heart. On giving the adrenalin it was noticed that blood was obtained

*The following report gives the essentials of two discussions, one in Dr. Cabot's Third Year class, the other at a conference of the hospital staff.

**Recently senior interne on the East Medical service.

after inserting the needle a very short distance, one-half to three-quarters of an inch. He was then dead.

Clinical Discussion

in dr. cabot's class

Dr. Richard C. Cabot: These early attacks are typical angina pectoris. Under these conditions the later attacks mean blocked coronary.

One of the things which we do not always recognize is that the embarrassment of the heart produced by gas in the stomach can produce an anginal attack just as exertion may, because the heart has to work against the distention as well as against the indigestion that ordinarily is behind the gaseous distention.

"Some gain in weight," probably because of latent edema.

Alcohol injection was done. Dr. White, will you tell us about that?

Dr. James C. White: Before 1927 we were doing classical cervical sympathectomies, using the complete operation of Jonnesco or the partial one described by Coffey and Brown. These operations had been done eight times in this hospital with a mortality of 25 per cent and benefit to only 25 per cent. In 1926 Mandl in Vienna showed that if he injected novocain into the upper five thoracic sympathetic ganglia on the side to which the cardiac pain was referred he could relieve the painful attacks for a period of days and occasionally for weeks. In 1926 Swetlow of New York improved on this by injecting alcohol instead of novocain. Following an accurate injection of alcohol the relief of angina pectoris is very often permanent.

In this case I marked the spinous processes of the upper five thoracic vertebrae, and four centimeters to the left inserted needles ten centimeters long, going in straight until I touched the lower border of the rib. Then I pushed each needle three centimeters below the rib downward until I touched the side of the vertebra. This is the level at which the sympathetic ganglia lie. If you inject alcohol around them and put it in with sufficient accuracy, you can completely stop attacks of angina pectoris. We have verified this by experimental works on dogs in the following way. Sutton and Lueth have given us a method for temporarily occluding the left coronary artery in the unanaesthetized dog. In the normal dog, coronary occlusion cannot be maintained for more than 10 or 15 seconds without causing symptoms very suggestive of angina pectoris. Using such a preparation, we have shown that if one cuts either the upper five pairs of posterior thoracic roots or removes the upper four sympathetic ganglia, then the coronary circulation can be shut off and no pain results. We therefore have pretty good experimental evidence that cardiac pain can be prevented either by resection or alcohol injection of the upper thoracic ganglia, or by section of the corresponding posterior roots. All of these methods have now successfully stood the test of clinical experience. Ideally I should prefer to operate in all cases, because I should then be sure of destroying the desired nerves completely. If you do an operation of that severity, however, on a patient with a heart bad enough to have angina pectoris, your operative mortality is likely to amount to nearly 20 per cent. If you do it with alcohol, as we have done thirty times, there seems to be little risk, and eighty per cent of the cases have turned out very satisfactorily. One woman eighty-five years old was moribund at the time of injection, but had experienced such terrific pain that we decided to do an alcohol injection although we thought it was very likely that she would die within a few days. She developed pneumonia and died three days later. That however is the only patient who had any serious complication, or in fact any complication of any sort beyond a mild intercostal neuralgia.

Dr. Maurice Fremont-Smith: How long do they stay relieved?

Dr. White: Only three of these patients have shown any signs of recurrence and none of these have become severe enough to require further surgery.

Dr. Cabot: "Complete relief of the pain." That is very impressive, I think.

He has a plateau pulse. Thus we have three out of the four cardinal symptoms of aortic stenosis. He had a rather small pulse pressure, going with his plateau pulse.

The diminished sensation on the left side was the result of your operation, wasn't it?

Dr. White: I think so, although usually the intercostal nerves regain their function after two or three weeks.

Dr. George W. Holmes: The film taken at the first entry shows a prominence of the cardiac shadow to the left without any corresponding prominence to the right. The heart lies rather horizontally in the chest. The aortic knob is perhaps a little prominent, but there is no evidence of dilatation. In other words this is the type of heart we should expect to see with enlargement of the left ventricle.

At the time of the second examination there is no appreciable increase in the size of the heart. These measurements show a slight variation, but well within the error of the method. The left diaphragm seems to be much higher for some reason which I am unable to explain. He may have had fluid in the abdomen. The supracardiac dullness shows a marked increase over that shown in the previous film.

A Student: Is the right border of the heart in the first film unusually straight?

Dr. Holmes: In this film the heart does not

appear to the right of the spine, except a little here. This curve is the ascending aorta. This film was taken with short exposure; it is underexposed and the other is overexposed. I am not sure whether this shadow represents the right auricle or the border of the spine. I do not think there is any evidence of dilatation in either examination. I do not understand why there should be such a marked change in the supracardiac shadow unless the aorta actually dilated in the interval. The high position of the diaphragm would affect it to some extent. High position of the diaphragm widens the aortic loop, and it may be all we have here.

It is of some interest too in these cases to note any change in the hilus shadows. In beginning failure of the heart the pulmonary vessels may become more prominent. I cannot see that there has been any definite change in the hilus shadows in this entry.

To sum it up, then, he has evidence of enlargement of the left side of the heart which has been present over a long period of time. Since the first examination there has been a change in the supracardiac shadow which may be due to the high position of the diaphragm or to actual dilatation of the aorta.

DR. CABOT: In a few minutes I shall be discussing the question as to whether or not he has extensive calcification of the aortic valve.

DR. HOLMES: We have been doing pretty well for a number of years, but I cannot help you in this case.

DR. CABOT: Do you do better with the fluoroscope?

DR. HOLMES: Yes. Recently we have succeeded in getting something on the films. The films have to be taken with very short exposure and are exceedingly difficult to interpret. In the fluoroscope, calcification of the aortic valve is sometimes quite obvious.

DR. CABOT: Nitroglycerin and amyl nitrite did not relieve him, which is just what you would expect. You would expect that one-half grain of morphia might relieve him and might not. It is no sort of use to bother with amyl nitrite when a person has this pain. I think it is waste of time.

I think the main features about this case, the essential facts, are perfectly clear. We have no doubt at all that he has had one or in all probability a number of attacks of coronary block. I have very little doubt that he has aortic stenosis, in spite of the fact that there is no diastolic murmur. We always hesitate a little to make a diagnosis without it, because a lesion which produces stenosis is almost certain, so far as we can see after death, to produce regurgitation. It has to be admitted however that such cases do not always have a diastolic murmur, so its absence is not enough to exclude aortic stenosis. Supposing it is aortic stenosis, the question remains whether it is of an arteriosclerotic type, a rheumatic type or of this type which Dr. Mallory has not yet named, in which we have extensive calcification, usually without rheumatic history, without any evidence of syphilis, and not believed by the pathologist to be arteriosclerotic; therefore of some third type which I suspect a little to have been due to bacterial endocarditis or to some other type of non-rheumatic productive vegetative endocarditis. Between those I do not see that we have any good evidence except the rheumatic history. Rheumatic fever, eight weeks in bed, is a pretty straight rheumatic history. I have no doubt it was that; at least seventy per cent of those cases later show some valve lesion. It seems to me reasonable to say, therefore, that it is aortic stenosis of the rheumatic type rather than the calcified type, although we have no certainty about that.

I have nothing else to say except to comment on this cyanosis, which is strikingly described and about which I know nothing. I have never seen a case. If it means anything in particular, for instance if it has any relation to pulmonary thrombosis, I do not know it. That produces intense sudden dyspnea, intense cyanosis not gradually spreading down over the body as here.

We should find a man with the arteriosclerosis of his age, with a hypertrophied left ventricle, with scars in that left ventricle corresponding to more than one old and perhaps also new cardiac infarctions, and an aortic stenosis which I think will more probably be of the rheumatic type, in case the pathologist can decide.

A STUDENT: Did you say that there would probably be some regurgitation there too?

DR. CABOT: When we look at a rigid aortic valve postmortem we see, of course, that it is narrowed so that the blood cannot get out without making a noise. We also see that the rigid orifice remains partly open during diastole; it cannot possibly close. So the only reasonable thing seems to me to say is that there is some regurgitation.

A STUDENT: Even with a plateau pulse?

DR. CABOT: Even with a plateau pulse. Even then I cannot myself, from the physics of the thing, see how there can fail to be regurgitation.

May we know the house diagnosis?

DR. TRACY B. MALLORY: Angina pectoris, coronary thrombosis, old, calcareous aortic stenosis, possible rupture of the heart with hemopericardium.

DR. CABOT: I do not see any reason to suppose rupture of the heart.

DR. FREMONT-SMITH: Could the nitroglycerin have acted slowly and given him a vasodilatation?

DR. CABOT: I do not believe it.

DR. FREMONT-SMITH: You are apt to feel it in your head.

DR. CABOT: Yes, you do feel it in your head —headache.

A STUDENT: Did the alcohol injection operate by preventing sensation reaching the sensorium?

DR. WHITE: There is a great argument at present on the subject. I think the best evidence is that some visceral pain pathways ascend directly in the sympathetic nerves, while there is also the element of referred pain described by Head and Mackenzie.

A STUDENT: Can you see any analogy between the pain of Raynaud's disease and the pain of angina pectoris?

DR. WHITE: In Raynaud's disease I think the pain is due to ischemia of the skin and reaches the sensorium through the cerebrospinal nerves.

A STUDENT: Is it true that this alcohol injection allows the angina pectoris patients to keep on going without symptoms when they really, for their own good, should stop?

DR. WHITE: I have never seen a patient who lost his danger signal completely. Take this man—we did not rate him 100 per cent relieved for the first three months, but more nearly ninety per cent. He did have distinct sensations that told him when he had an attack, even though he did not have definite pain. Then for two years and eight months after that he had fifty per cent relief and another pain on the right side. You will find that nearly all these people will have either mild right-sided angina or flushing of the face or some other queer warning sensations. I know of one patient in Baltimore who walked himself to death and died painlessly. This however is certainly very rare. In a great many cases these individuals were so exhausted that the relief from alcohol injection was an absolutely life-saving procedure.

A STUDENT: What about that radiation to the right arm and shoulder in the later attacks?

DR. WHITE: This procedure would not have affected his right side at all.

A STUDENT: I was wondering whether that transference of radiation to the right is ordinary.

DR. WHITE: We do not know yet whether right-sided angina is due to disease in the right ventricle or just what is the differentiating factor between right and left-sided angina. I have had one case of purely right-sided pain relieved completely by a right-sided injection.

CLINICAL DISCUSSION

At Staff Conference

DR. CAPPS: It was thought he had angina pectoris with arteriosclerotic heart disease and probably coronary occlusion at the first admission and three and a half months before the second admission. It was also thought that he had calcareous aortic stenosis.

The diagnosis at the second admission was angina pectoris with old coronary thrombosis and questionable calcareous stenosis. It was felt that he had a rupture of the heart muscle with hemopericardium and cardiac tamponade.

DR. WHITE: This patient had had such severe angina pectoris following his previous coronary occlusion that for nineteen months he could not work. He came in here saying he would rather be relieved of his pain so that he could work even if it should shorten his life in so doing, and we did the injection on that understanding. Following that he was able to work until three months before he died. He was really converted from a very severe case of angina pectoris to a reasonably mild one, and though he took nitroglycerin he was able to carry on his work perfectly well for two and a half years after the injection. It is probable that all four of his upper thoracic sympathetic ganglia were not entirely blocked. We have had cases die of coronary occlusion where they have had absolutely no pain whatsoever after the injection. We also had three cases die after the ganglia had been removed surgically. In these cases there was intense cardiac pain on the right stopping completely at the midline, so that they felt no pain on the denervated left side.

DR. CAPPS: As a matter of fact his pain after the alcoholic injection was mostly right-sided. His condition as found in the Cardiac Clinic was considered to be ninety per cent improved during the first few months, dropping down to fifty per cent during the next two years. Then apparently he had left sided pain as well.

DR. WILLIAM B. BREED: I think we have not enough facts to make a diagnosis of calcareous aortic stenosis in this case. To be sure there was a so-called musical systolic murmur loudest at the base and extending over the precordium. There was no thrill, and we have of course no x-ray evidence, although we do not know that the valves were particularly looked at. Although the discharge diagnosis was calcareous aortic stenosis I should be quite doubtful about it.

DR. MALLORY: I should like to say a word in behalf of the X-ray Department, because I think their situation is much like ours. That is, you clinicians can get a great deal more valuable service out of any laboratory if you explain what you are looking for. Many determinations easy to make with a special technic are difficult or impossible to pick up with routine methods.

CLINICAL DIAGNOSES (FROM HOSPITAL RECORD)

Angina pectoris.
Coronary thrombosis, old.
Calcareous aortic stenosis.
Possible rupture of the heart with hemopericardium.

DR. RICHARD C. CABOT'S DIAGNOSES

Angina pectoris.
Coronary thrombosis.
Aortic stenosis (rheumatic type?)

ANATOMIC DIAGNOSES

Coronary thrombosis, old, left.
Calcareous aortic stenosis.
Cardiac hypertrophy.
Anomaly of the coronary arteries.
Arteriosclerosis, coronary, aortic and renal.
Fibrous pleuritis, left.
Acute duodenitis.

Pathologic Discussion

IN DR. CABOT'S CLASS

DR. MALLORY: This case is a particularly poor one in which to try to settle that question of the relation of pain to the diseased vessels in the heart, because this man had anomalous coronary arteries, a very tiny right one, and he must at one time have had a very large left one which gave off two descending or interventricular branches instead of one as it usually does. Both of these branches were completely thrombosed. The circumflex branch of the left had two main branches and those were also thrombosed, so that the very small right coronary, approximately one quarter the size of normal, was the only patent vessel in his heart. The thrombi in both were old; one seemed somewhat older than the other. I think we must guess that the most recent one was several months old. The other might have been years old, since it was completely calcified. In spite of the very extensive thrombosis there was no sign of infarction. The heart was considerably hypertrophied, weighing 600 grams. That is rather more than the x-ray would suggest. There was a definite aortic stenosis, a little unusual in type. This man did have, though not in striking degree, a definite calcareous stenosis. I do not think that arteriosclerosis alone very often causes aortic stenosis, but I believe it sometimes can and that this is one of the cases in which it did. In the average aortic stenosis, if one looks down on it from above one finds that the valve margins have been retracted and the edges have become fused together to form a solid calcareous ring with an opening in the center which may be from two centimeters in diameter down to a surprisingly few millimeters. That type of case, where the calcification extends out to the periphery, is the type of which Dr. Cabot was speaking where there is no soft free membrane to close up in diastole what little hole is left. That type of course must have some degree of regurgitation always. In a very large proportion of elderly people, from sixty up, if one feels the base of the cusps in the aortic valve one finds a little hard ring there. One begins to notice hardening at that spot late in the forties, it gets fairly common in the fifties, almost universal in the sixties and seventies. Ordinarily it remains a localized area of calcification, but sometimes it extends up in a rather pyramidal form until it makes a wedge shaped projection. If one looks at the back of one of these valves, that is the surface facing the sinus of Valsalva, one finds a small pyramid of calcification the apex of which extends nearly up to the upper margin of the cusp. It stiffens the basal portion of the valve and causes it to project out far enough to produce definite stenosis. On the other hand, the free margin may still be uninvolved and soft, so that closure in diastole is not interfered with in the least. So that with this type of lesion you can get enough stenosis to get the characteristic physical signs and at the same time have no regurgitation. It is however rather unusual. I think we have had in the last thousand autopsies about three or four cases of this type in which there were physical signs of aortic stenosis. It is pretty rare, whereas we have had at least ten or a dozen cases of the usual calcified type in the interval.

A STUDENT: This was of the rare type?

DR. MALLORY: Yes; it is rare in the sense that it is unusual for these deposits to be great enough to give signs of stenosis.

A STUDENT: It is not the type Dr. Cabot spoke of as your fourth type?

DR. MALLORY: It is a definitely arteriosclerotic one.

DR. HOLMES: Was anything wrong with the aorta?

DR. MALLORY: No. There was very slight sclerosis and it seemed narrower rather than wider than normal.

DR. CABOT: I take it you had scars in the myocardium corresponding to the blocked coronaries.

DR. MALLORY: None at all; a perfectly normal myocardium.

DR. CABOT: That is, the collateral was enough to carry on?

DR. MALLORY: Yes.

Further Pathologic Discussion

AT STAFF CONFERENCE

DR. PAUL D. WHITE: I think that the comparison of the two examinations three and a half years apart would have helped a good deal in diagnosing aortic stenosis. There had been a considerable change in pulse pressure and in the character of the pulse and apparently also in the intensity of the murmur. He was at an age when one might have been suspicious of aortic stenosis even at the first examination. The second time it was a reasonable diagnosis. The thrill I do not believe to be an essential feature in the diagnosis. We are now underdiagnosing aortic stenosis rather than over-

diagnosing it. I was taught in school to be excessively conservative about the diagnosis. As a result of that warning I had to find aortic thrill, aortic systolic murmur, absence of the aortic second sound and a plateau pulse along with enlargement of the heart in order to diagnose aortic stenosis. This attitude was justified at that particular time (twenty years ago) because diagnoses of aortic stenosis were being made on the presence of a systolic murmur alone at the aortic area. We then became very conservative, and for a good many years most cases of aortic stenosis were missed by us. Now with renewed interest in the subject our percentage of correct diagnoses is higher than it was ten years ago because we are, I think, justified in making a diagnosis in just such a case as this. A loud aortic systolic murmur with or without a thrill, plateau pulse or absence of the aortic second sound may indicate aortic stenosis; rheumatic history, aortic regurgitant murmur and absence of evidence of marked dilatation of the aorta all aid in making the diagnosis.

Calcareous changes in the aortic valve are present in two thirds of all cases of aortic stenosis and these are simply the older patients, as we have found out in a recent careful analysis of all the cases of aortic stenosis that have come to postmortem examination here at the Massachusetts General Hospital, which will be published shortly by Dr. McGinn and myself. There may or may not be a clear rheumatic history back of the cases of calcareous aortic valve disease. Mönckeberg's sclerosis is probably less common as a prime factor than is rheumatic or other infectious endocarditis.

The point about the right sided pain is of interest. Evidently from his history he did have more pain on the right side after the injection than on the left side. I think the reference of pain to the right side in this case is due to the severity of the pain. Generally speaking the more severe the pain the further it is transmitted; only the severest cases in my experiences have shown reference of the pain to the right arm. If he had not had an injection on the left side he probably would have noticed little pain on the right side. The pain simply spread to the right as well as to the left and was limited to the right side towards the end of his life because the pain on the other side had been controlled.

CASE 19412

SEVERE CARDIAC PAIN WITH A QUESTION AS TO THE IMMEDIATE CAUSE OF DEATH

Medical Department

Presentation of Case

Dr. Richard B. Capps:* This case is that of a forty-nine year old barber who entered the hospital complaining of severe pain in the left chest and hand of eight hours' duration.

He was perfectly well until two weeks before admission, at which time he noticed that on walking rapidly he had a sense of constriction in his left chest and a numb feeling in the palm of his left hand. He had no pain at all in the arm. He also noticed a little dyspnea on exertion which he had not had previously. His condition continued in status quo until eight hours before admission, when he was suddenly taken with a very severe knife-like pain in the precordial region and severe pain in the left hand. He broke out into a cold sweat and was forced to sit down. The sharp pain passed away in a few moments, but pain continued with recurring exacerbations until the time of admission. He was given green capsules and "sleeping pills" by his physician without relief, and in the Emergency Ward he was given nitroglycerin, which did not help him either.

The past history is entirely negative except for typhoid fever in youth and vague epigastric discomfort which he had had for fifteen years, mostly after meals.

Physical examination showed a well developed and nourished man lying flat in bed with obviously severe precordial pain which came on in attacks every three to five minutes. There was slight sclerosis of the retinal vessels. The radials were moderately thick. The heart was not enlarged to percussion. The apex impulse could not be seen or felt. The sounds were of very poor quality, with tic-tac rhythm. The rate was 70, with sudden shifts to 110, then back to 70 again. The rhythm was perfectly regular at either one of the two rates. The pulses were full. The blood pressure was 145/120. The aortic second sound was much increased. There were no signs of decompensation.

The white cell count was 13,600. The nonprotein nitrogen was 33. A Hinton test was negative.

An electrocardiogram showed ventricular premature beats interrupting normal rhythm, rate 105, and a characteristic Pardee's sign, high origin S-T interval in leads T_1 and T_2.

He was given morphia and was kept quiet. The temperature on admission was 102°, falling slightly after the first four days and rising again to 102°. The white cell count remained about the same, falling slightly during the first ten days and rising again. Clinically he improved after the second day. A definite pericardial friction rub was heard and later a pleuropericardial rub over the apex. Six days after admission Dr. Paul White saw him and heard a loud third sound at the apex which he felt meant impending ventricular failure.

On the twelfth day the patient had gradual onset of moderately severe aching precordial pain with some dyspnea and sweating. He

*Recently senior interne on the East Medical service.

turned ashen gray in color and looked very ill. Sonorous bubbling râles were heard at the right base. The blood pressure was 85/40. He died the following day.

Clinical Discussion

Dr. Capps: It was thought at admission that he had acute coronary occlusion. The discharge diagnosis was arteriosclerotic heart disease and coronary thrombosis. There also was a question as to the origin of the pulmonary signs. It was thought by some that these indicated a pulmonary embolus.

Dr. Paul D. White: As Dr. Capps said, I saw the patient on the sixth day, six days before he died. He seemed a moderately severe, possibly more than a moderately severe case of typical coronary thrombosis probably involving the left coronary artery with an infarct in the anterior wall of the left ventricle.

The electrocardiogram is very clear, taken a few days after he had his attack; it is absolutely typical of coronary thrombosis supposedly involving the anterior wall of the left ventricle. In this stage of coronary thrombosis it is impossible to predict any certain outcome; the prognosis is always to be considered doubtful. We can justifiably be pessimistic about the cases with prolonged extreme prostration at the time of the first attack, and with very low blood pressure for a good many hours or a few days. Such cases generally die, but there are exceptions. Even the patients who seem to be doing well should be put on the "danger list" for two or three weeks. The termination in this case, thought to be pulmonary embolism, might have been the result of an acute failure of the left ventricle possibly precipitated by an abnormal rhythm.

An electrocardiogram was taken the morning he died; at that time there was no particular change in it. Later however his heart rate went up to 140. Possibly that meant abnormal ventricular rhythm to be followed by ventricular fibrillation at the time of death.

Dr. Tracy B. Mallory: Where were the râles heard, Dr. Capps?

Dr. Capps: At the right base.

About the blood specked sputum, I think there were spots of blood, not really frank blood.

Dr. William B. Breed: I saw him during the last week of his illness. As I remember him, and from the record, I think there is no evidence that he had definite pulmonary embolism. I remember there was some discussion and we decided that we would not discharge him with that diagnosis, therefore we omitted it in the discharge note.

There is one question that I should like to ask about Dr. White's consultation, that is, the significance of the third heart sound in regard to impending left ventricular failure. I was interested in that note; I did not understand it.

Dr. White: Of course we really mean gallop rhythm when we hear a loud third sound in diastole with tachycardia in a patient with strain on the left ventricle. The rate was rapid enough here to make the third sound produce the impression of protodiastolic gallop rhythm. If the rate is under 100 it is not so satisfactory to call the rhythm a "gallop", but the mechanism is the same, the rate controlling the impression of the presence or absence of gallop rhythm.

Gallop rhythm with a third sound early in diastole in the case of a patient with ventricular weakness is a serious sign but is often overlooked. Often the third sound is not so prominent as the actual extra impulse that the heart gives at that time; there is a protodiastolic gallop thrust which can be felt more easily than the sound can be heard. No completely adequate explanation of the prominent third sound has yet been presented. It is, however, probably the result of the combination of a dilated left ventricular cavity and increased venous pressure of the blood pouring into the left ventricle from the auricle with considerable force in early or late diastole. Sound and impulse result from the same mechanism. Gallop rhythm is a very important sign of weakness of the left ventricle and it is a bad sign. One sees in the literature now a good many observations about presystolic gallop rhythm but protodiastolic gallop rhythm is much more important than presystolic gallop rhythm and it is also more common. With a pulse that is very fast it is difficult to tell which type it is, but with experience I am quite sure that one can tell in nearly every instance. With protodiastolic gallop rhythm the extra sound comes very close to the second sound and not near the first. One of the uncommon causes of protodiastolic gallop rhythm is partial block; when the ventricular contraction is delayed the auricular contraction may be heard early in diastole. If there is not much delay in ventricular contraction the auricular impulse may be rather forceful and may then be heard long enough ahead of the ventricular contraction to give rise to presystolic gallop rhythm. I am quite certain it is not the auricular systole that is usually accentuated, but the third sound.

Dr. Breed: I take it that in gallop rhythm when the third sound moves backward towards the second sound it is of graver significance.

Dr. White: I do not think it moves back. It stays level. It is a little less than one tenth of a second after the second sound. It is regular in timing. It is in exactly the position of a normal third sound in a young person so far as we know now. It is very difficult to estimate the time intervals, however, when the pulse is very fast.

Dr. Mallory: How low can the pulse pres-

sure be maintained with life? Here it was down almost to 20.

DR. WHITE: How long did it stay down?

DR. CAPPS: It was 20 at admission.

DR. WHITE: It rose occasionally to 45 and remained most of the time at about 30 for the rest of his life. That is a bad sign I should say, but it does not always mean that death is imminent, because a patient may recover for several weeks at least after temporary marked hypotension.

DR. MALLORY: You say on less than 20?

DR. WHITE: Not for a long time. I think life cannot be maintained for many hours or days with a pulse pressure under 20.

DR. BREED: What is the correlation between infarcts involving the interventricular septum and the appearance of heart block?

DR. WHITE: It used to be considered that heart block was an important evidence of coronary thrombosis and that it was serious. I think that the serious significance still holds, but I can remember only rare cases showing heart block as a result of coronary thrombosis. In this case there was no sign of heart block at all. The infarct usually does not involve the region of the bundle of His.

CLINICAL DIAGNOSES (FROM HOSPITAL RECORD)

Coronary thrombosis.
Pulmonary embolism.

ANATOMIC DIAGNOSES

Thrombosis of the left descending coronary artery.
Myocardial infarction of the left ventricle.
Mural thrombus of the left ventricle.
Acute fibrinous adhesive pericarditis.
Fibrous pleurocarditis.
Bilateral hydrothorax.
Bilateral healed apical pulmonary tuberculosis.
Chronic fibrous pleuritis.
Pulmonary edema.
Arteriosclerosis, marked coronary, moderate aortic.
Cortical cyst of the kidney.

PATHOLOGIC DISCUSSION

DR. MALLORY: In this case we found a fresh coronary thrombosis and an infarct of the left ventricle which involved a portion of the interventricular septum but not very much, simply the apical end. In cases in which the interventricular septum is infarcted we have the possibility of thrombi developing in both the left and right ventricles, in which case we should have a source for pulmonary embolism in the heart itself. In this case there were thrombi in the left ventricle over the area of infarction, but not in the right.

There was no pulmonary embolism. There was moderate pleural effusion on that side, 500 cubic centimeters, and marked congestion which I think was the cause of the râles.

From the anatomic point of view the striking feature of the case was the pericarditis. A certain degree of pericarditis is of course the rule with coronary thrombosis. Ordinarily it does not amount to more than a few strands of fibrin on the surface of the area of necrosis. In this case there was a diffuse fibrinopurulent pericarditis involving the entire sac, covering every portion of the heart, instead of just the area of epicardium immediately over the infarct. I do not remember having seen that before. Whether it was of any significance in regard to the symptomatology I have no idea.

A PHYSICIAN: Did you say it was fibrinopurulent?

DR. MALLORY: Perhaps one can hardly say purulent. It was extremely cloudy fluid, and the rough shaggy masses of fibrin were of the so-called "bread and butter" type.

DR. WHITE: I think you should all see the electrocardiogram in this case because it is such a good example of an infarct involving the apical region of the left ventricle.

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"DAMAGED LIVES"

FOR the past few weeks a motion picture with the above title has been drawing large audiences to one of Boston's theatres. The picture represents a sincere effort to educate the public as to the dangers of acquiring syphilis—and incidentally gonorrhea — through promiscuous sexual relations, to make them aware of the terrible consequences if the disease is not adequately treated, and to assure them of the possibility of cure if the infected person places himself in the hands of a reputable physician.

In spite of the fact that the play is loaded with propaganda, it is not without merit as a dramatic production. The cast is excellent; the appeal to one's sympathy is great. There is nothing cheap or tawdry about the play. If the situation seems to be attended by a bit more hysteria than is warranted, we may excuse it on the score of dramatic license. The play is followed by a lecture which describes clearly and in a dignified manner the nature of syphilis and gonorrhea.

The picture carries the approval of the American and the Massachusetts Social Hygiene Associations. That there is public appreciation of such a presentation is evidenced by the size and respectful attention of the audiences that have filled the theatre night after night.

The education of the public, particularly its more youthful members, cannot fail to reduce to some degree careless exposure to infection, and to arouse in those who may become infected a determination to continue treatment until a cure is reached. On the other hand, is the medical profession doing its best for these sufferers? "Clinics and Field Agency Relationships in Syphilis and Gonorrhea Clinics," which appears in this issue of the *Journal*, leads us to believe that there is much room for improvement. As a result of her intensive work in Boston hospitals, the author finds numerous defects in our care of the syphilitics who apply for help. There is, for example, an average delay of six weeks between the first visit of the pregnant woman who has syphilis and the institution of treatment. After the baby is born, and the postpartum period is ended, many of the mothers fail to continue treatment. Children with congenital lues frequently drift from one clinic to another for years before proper treatment is begun; too frequently permanent, irreparable damage has been caused by the delay. More care is needed in the detection of disease in the other members of the families of patients with syphilis.

Mrs. Morris' criticisms are by no means entirely destructive. She offers a number of practical suggestions for the better functioning of syphilis clinics, particularly as regards their coöperation with other departments. Her "Clinics and Field Agency Relationships in Syphilis and Gonorrhea Clinics" well deserves a place in a medical journal, for the physician who looks only at the disease, who does not consider the patient both as a whole and as a unit in society, is not living up to his responsibilities.

THIS WEEK'S ISSUE

CONTAINS articles by the following named authors:

JORDAN, WILLIAM R. B.S., M.D. University of Virginia School of Medicine 1928. Medical House Officer, Massachusetts General Hospital 1928-1930. His subject is "Neurological Manifestations of Hypoglycemia." Page 715. Address: 1214 West Franklin Street, Richmond, Virginia.

LUND, CHARLES C. A.B., M.D. Harvard University Medical School 1920. F.A.C.S. Surgeon to the Collis P. Huntington Memorial Hospital, Boston. Assistant Visiting Surgeon to the Boston City Hospital. Instructor in Sur-

gery at the Harvard Medical School. Address: 319 Longwood Avenue, Boston. Associated with him is

HOFFMAN, VIRGINIA. Voluntary Assistant, Collis P. Huntington Memorial Hospital, Boston. Address: 695 Huntington Avenue, Boston. Their subject is "The Accuracy of Death Certificate Diagnoses in Cases of Buccal Carcinoma." Page 719.

GOLDTHWAIT, JOEL E. B.S., M.D. Harvard University Medical School 1890. F.A.C.S. Consultant in Orthopedic Surgery at the Massachusetts General Hospital. Formerly Chief of and Organizer of the Orthopedic Service at that Hospital. Formerly Chief of Orthopedic Service at the Carney Hospital. Formerly member of the Staff of the Children's and Good Samaritan Hospitals. Former President of the Robert Breck Brigham Hospital. His subject is "Backache." Page 722. Address: 372 Marlborough Street, Boston.

HAWES, JOHN B. 2ND. A.B., M.D. Harvard University Medical School 1903. President, Boston Tuberculosis Association. Director, Massachusetts Tuberculosis League and National Tuberculosis Association. Address: 11 Marlborough Street, Boston. Associated with him is

STONE, MOSES J. M.D. Tufts College Medical School 1921. Assistant Professor in Diseases of the Chest, Boston University Medical School. Examiner in the Tuberculosis Clinics of the Boston Health Department. Physician at the Chest Clinic of the Massachusetts Memorial Hospitals. Assistant in Medicine, Beth Israel Hospital. Address: 11 Marlborough Street, Boston. Their subject is "A Plea for the More Extended Use of Pneumothorax Therapy in the Home Treatment of Pulmonary Tuberculosis." Page 729.

MORRIS, EVANGELINE H. B.A., B.N. Principal of Waterloo Academy in Canada, 1922-1924. Present position: Social Hygiene Supervisor, Community Health Association, Boston. Her subject is "Clinic and Field Agency Relationships in Syphilis and Gonorrhea Clinics." Page 735. Address: Community Health Association, 581 Boylston Street, Boston.

CASTALLO, MARIO A. A.B., D.N.B., M.D. Jefferson Medical College 1929. Assistant Demonstrator of Obstetrics, Jefferson Medical College, Philadelphia, Pa. Clinical Assistant in Obstetrics, Jefferson Medical College Hospital. Formerly Visiting Gynecologist, St. Joseph's Hospital, Providence, R. I. Visiting Obstetrician, Sofia Little Home, Providence, R. I. His subject is "Pernocton Hypnosis in Obstetrics with a Report of 103 Cases." Page 744. Address: 5919 Greene Street, Germantown, Philadelphia, Pa.

THE MEETING OF THE COUNCIL OF THE MASSACHUSETTS MEDICAL SOCIETY

ON October 4, 1933 the Council welcomed Dr. William H. Robey, its new President, as presiding officer of the first Council meeting following that in June. A large proportion of the Councilors were present and were especially pleased at the conduct of the meeting and the general spirit which pervaded the assembly. The work was conducted as expeditiously as possible and several matters of considerable importance were acted upon.

One of the newer movements was that of providing a legal counsel for the Committee on State and National Legislation under the motion of Dr. W. A. Lane. This brought from Dr. Miles of Brockton a very spirited appeal for coöperation in dealing with the legislation of this Commonwealth. Dr. Miles found that there had not been evidence of coöperation on the part of the medical profession in dealing with matters before the Legislature relating to medical affairs. He urged the members to take upon themselves a feeling of responsibility for assisting the Committee on Legislation and their representatives in the Legislature to bring about better conditions in medical affairs in this State. He made it perfectly plain that when important matters, such as vaccination, were before the committees of the Legislature that very few doctors were in attendance and that Dr. Samuel B. Woodward, with a few of his associates, was almost unaided in the presence of a hall filled with opponents. Dr. Miles promised the Society his best efforts to help in bringing about remedial legislation.

Another important matter was that presented by Dr. Frederic J. Cotton relating to a board to pass upon the proposed suits against physicians. He believed that if the Society could be represented by a committee, in conference with a committee of the State Legal Association, that plans could be developed that would be of assistance in bringing about better conditions. He felt that since the State had adopted the policy of asking the advice of expert psychiatrists in dealing with criminal cases that it would be a logical step in the right direction to have matters relating to the suits against physicians dealt with in somewhat the same way.

Many other matters of great importance were presented and were acted upon promptly. Full details of this meeting will appear in the records of the Secretary which will be published in the *Journal* at an early date. These few notes should stimulate a careful study of the Proceedings.

MISCELLANY

DR. H. D. CHADWICK HAS TAKEN OFFICE

Dr. Henry D. Chadwick, who succeeded Dr. George H. Bigelow as Commissioner of Public Health, has assumed office and has announced that he will make no changes in the personnel or policies of the Department.

The new Commissioner comes to Massachusetts from Detroit, where he held the position of Tuberculosis Controller in the Health Department of that city.

Dr. Chadwick was born in Boscawen, New Hampshire, and graduated from the Harvard Medical School in the class of 1895. He became associated with the Waltham Board of Health as bacteriologist and was later appointed superintendent of the Vermont Sanatorium at Pittsfield, Vt., and remained there until 1909 when he left to take charge of the Westfield (Mass.) State Sanatorium. He continued at Westfield until 1929 and left in order to take up the work at Detroit. The clinics that since 1929 have been known as the Chadwick Clinics have made his name prominent throughout the country, and are the basis of the present program in Massachusetts which applies to infected school children and the agency leading to the detection of the unsuspected adult.

Dr. Chadwick's appearance in the office of the Commissioner was the occasion of floral tributes from employees of the Department, heads of various State divisions, members of the Chadwick Clinic, and friends and members of his immediate family.

The Massachusetts Medical Society

A WARNING RESPECTING PUBLICITY OF MEDICAL AFFAIRS

October 5, 1933.

To the *Editor*,
The *New England Journal of Medicine*,

Dear Mr. Editor:

Once again the Committee on Ethics and Discipline find occasion to remind their Fellows of the Massachusetts Medical Society of the mischances attending appearance in the lay press. An important piece of research, almost sensational in its implications for the relief of human ailments, is duly communicated by its authors to the medical public through professional journals; a reputable daily newspaper learns of it through a "flash" from a news agency; it is duly "written-up" by a feature writer who then seeks an interview with the authors for corroborative and additional material; the seniors of the medical group are absent on vacations, and their juniors—less experienced in the ways of the world—grant an interview to the reporter. Result: the "write-up" is published and, while quite well done, contains inaccuracies and adornments offensive to professional standards of good taste, and arouses among members of the profession criticism on the ground of unethical publicity, on which account it is brought to the attention of the Committee. Fortunately, the identity of both the medical group and of the newspaper estops any suspicion of intentional impropriety, the only unexplained circumstance being the failure—doubtless inadvertent,—of the newspaper to make good the promise of its representative to submit proof before publication. The moral is obvious:—any physician who is in any way responsible for material appearing in the lay press *must insist* on his privilege of reading and approving proof before publication. The Committee goes farther, however, and urges that physicians who are asked for press interviews on subjects concerning the art and science of medicine should courteously but firmly refuse to be interviewed, and should patiently explain to their incredulous lay brothers why they shun personal publicity.

The prompt and cordial coöperation of the Director and Staff of the Beth Israel Hospital and the complete accord of their views with ours is much appreciated by the Committee.

Yours truly,

DAVID CHEEVER, *Chairman*,
Committee on Ethics and Discipline,
Massachusetts Medical Society.

Beth Israel Hospital
330 Brookline Avenue
Boston, Mass.

October 2, 1933.

To the *Editor*,
The *New England Journal of Medicine*,

We should be grateful for the publication of the following letter in the *Journal:*

We desire to present certain facts in explanation of an article which appeared in the *Boston Evening Transcript* on August 7, 1933, about a research study of surgical intervention in the treatment of heart disease.

This article was based primarily on information derived by the *Transcript* from articles appearing in other recent publications (*Archives of Internal Medicine*, June, 1933; *Annals of Internal Medicine*, July, 1933; *Science News Letter*, August, 1933).

During the absence on vacation of the Physician-in-Chief, the Director of the Research Laboratories, and the Director of the hospital, a representative of the *Transcript* called on the telephone stating that the article was already set up and ready for release. Every effort was made to see that if the article were to be published, it should be accurate, in keeping with the facts, and modest in its claim. The representative of the hospital was assured that he would be given an opportunity to go over the final proof for correction before its publication. This representative called at the *Transcript* office but found the article already on the press.

We regret keenly the tone of the article and

the inaccuracies as to the authorship of the articles referred to.

Very truly yours,

HARRY LINENTHAL, *Physician-in-Chief.*
CHARLES G. MIXTER, *Surgeon-in-Chief.*
CHARLES F. WILINSKY, *Director.*

INFORMATION REGARDING THE EXTENSION COURSES ON POSTGRADUATE INSTRUCTION

October 9, 1933.

Editor, *New England Journal of Medicine,*

The following data give information in regard to the Extension Courses on Postgraduate Instruction for the Massachusetts Medical Society to date:

District	Membership	Cards Received
Barnstable	37	9
Berkshire	109	29
Bristol North	64	24
Bristol South	199	47
Essex North	192	48
Essex South	253	59
Franklin	32	19
Hampden	291	54
Hampshire	55	20
Middlesex East	96	24
Middlesex North	121	52
Middlesex South	768	126
Norfolk	715	112
Norfolk South	115	24
Plymouth	129	36
Suffolk	738	77
Worcester	381	92
Worcester North	86	18
Total	4381	870

The following districts are organized and ready to begin the course of instruction:

Berkshire
Bristol North (Taunton section)
Bristol South (Fall River and New Bedford)
Essex North
Essex South
Middlesex North
Norfolk (Faulkner Hospital section)
Norfolk South
Plymouth
Worcester
Worcester North

Courses started on October 9 in Plymouth District at Brockton; October 10 in Worcester North District at Fitchburg and will begin October 13 in Essex North District at Haverhill.

We have discovered that several Fellows of the Massachusetts Medical Society did not receive the card and folder concerning the courses of instruction to be given. The Committee regrets if any mail went astray and requests any member who has not received the information to write the Secretary of the Committee, 8 The Fenway, Boston, or communicate with the chairman of his district.

DISTRICT CHAIRMEN

Barnstable—Dr. J. I. B. Vail
Berkshire—Dr. Albert C. England and Dr. George S. Reynolds
Bristol North—Dr. William M. Stobbs and Dr. A. R. Crandell
Bristol South—Dr. Charles Shanks
Essex North—Dr. Francis W. Anthony
Essex South—Dr. Walter G. Phippen
Franklin—Dr. Halbert G. Stetson
Hampden—Dr. George L. Schadt
Hampshire—Dr. Edward W. Brown
Middlesex East—Dr. Joseph H. Fay
Middlesex North—Dr. Frederick P. Murphy
Middlesex South—Dr. Charles E. Mongan
Norfolk—Dr. Frank S. Cruickshank
Norfolk South—Dr. David L. Belding
Plymouth—Dr. Harrison A. Chase
Suffolk—Dr. Frank R. Ober
Worcester—Dr. Erwin C. Miller
Worcester North—Dr. C. Bertram Gay.

The faculty of instructors is in process of organization. The assignment of instructors will be completed in the near future. The individual districts will receive the information concerning the dates of each course and the instructors who will give the same. The Executive Committee plans to print the schedule of each district in this *Journal* as soon as the schedule is completed.

LEROY E. PARKINS, M.D., *Secretary,*
Executive Committee
on Postgraduate Instruction.

NOTICE

CLINIC AT THE PETER BENT BRIGHAM HOSPITAL

On Thursday, October 19, in the amphitheatre of the Peter Bent Brigham Hospital at 3:30 P.M. there will be a clinic conducted by Dr. Henry A. Christian, Hersey Professor of the Theory and Practice of Physic in the Harvard Medical School, to which physicians are cordially invited.

NOTICES OF MEETINGS

A SERIES OF CLINICAL MEETINGS AT THE FAULKNER HOSPITAL

On the first Thursday in each month at 5:00 P.M. throughout the winter The Faulkner Hospital will hold clinical meetings. All physicians who are interested are cordially invited to attend. The meetings will be clinical in nature and will consist of a clinical pathological discussion of the cases which have come to autopsy in the hospital and a short talk on some special subject of clinical interest. The meetings will begin promptly at 5:00 P.M. and will last approximately one hour.

The schedule is as follows:

1933

November 2 — a. Clinico-pathological conference.
b. "What the laboratory has to offer in the practice of medicine," Dr. J. Stewart Rooney.

December 7 — a. Clinico-pathological conference. b. "Recognition and treatment of unsuspected hypothyroidism," Dr. W. Richard Ohler.

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January 4 — a. Clinico-pathological conference. b. "Traumatic surgery," Dr. F. J. Cotton, Dr. Henry C. Marble.

February 1 — a. Clinico-pathological conference. b. "The treatment of obstetrical hemorrhage," Dr. J. R. Torbert.

March 1 — a. Clinico-pathological conference. b. "Recent advances in the clinical use of the electrocardiogram," Dr. Burton E. Hamilton.

April 5 — a. Clinico-pathological conference. b. "Surgical subject," Dr. Edward L. Young, Jr.

May 3 — a. Clinico-pathological conference. b. "Pediatric talk," Dr. W. W. Howell.

June 7—Clinico-pathological conference.

TRI-CITY MEETING

Philadelphia Pediatric Society, New England Pediatric Society and Pediatric Section of the New York Academy of Medicine, Saturday, 10 A.M., October 21, 1933, New York Hospital, 1304 York Avenue.

MORNING SESSION

Guests desiring to visit the wards of the Children's Pavilion of the New York Hospital will be conducted between 9:15 and 10:00 A.M.

10:00 A.M.

1. Heat loss by vaporization and radiation. Presented by Eugene F. Du Bois, New York Hospital; James D. Hardy, Ph.D., Russell Sage Institute of Pathology.
2. A consideration of the new preparation of diphtheria toxoid. Presented by William H. Park, Department of Health, New York City, Bureau of Laboratories.
3. A clinical investigation of the development of caries in the deciduous and permanent teeth. Presented by Alfred F. Hess, New York City.
4. Some clinical aspects of chronic hemorrhagic pachymeningitis. Presented by Rustin McIntosh, Babies' Hospital.
5. Epidemiology reviewed in the light of experiment. Presented by L. T. Webster, Rockefeller Institute for Medical Research.

LUNCHEON

12:45 P.M.

Luncheon at the New York Academy of Medicine, 2 East 103rd Street.

AFTERNOON SESSION

At the New York Academy of Medicine

2:15 P.M.

1. Prophylaxis of rickets with viosterol in the premature infant. A study of the clinical, chemical and roentgenological findings. Presented by Leonard T. Davidson, Katharine K. Merritt, Babies' Hospital.
2. Creatin metabolism in muscular disease. Presented by A. T. Milhorat, Cornell Medical College, Department of Pharmacology.
3. The effect of training during infancy on behavior development. A study of twins. Presented by Myrtle McGraw, Babies' Hospital.
4. Water requirements in infants. Presented by Samuel Z. Levine, New York Hospital.
5. Basal metabolism in children with splenomegaly. Presented by Anne Topper, Mt. Sinai Hospital.

GERALD HOEFFEL, M.D., *Secretary*,
New England Pediatric Society.

NEW ENGLAND MEDICAL SOCIETY

GUEST SPEAKER—DR. EUGENE POOL

On Thursday, October 19, at 8 o'clock Dr. Eugene Pool, Clinical Professor of Surgery at Cornell University Medical College, will present a paper on "Chronic Duodenal Stasis" before the New England Medical Society in the Evans Auditorium of the Massachusetts Memorial Hospitals, 80 East Concord Street, Boston. Telephone: Kenmore 9200.

The discussion will be opened by Drs. David Cheever, Charles T. Howard, Fred B. Lund, Richard H. Miller, and Irving J. Walker.

Physicians are cordially invited to attend.

BOSTON UNIVERSITY SCHOOL OF MEDICINE

WILL CONDUCT

CLINICAL MEETING AT BOSTON CITY HOSPITAL

Dr. Eugene H. Pool, Professor of Clinical Surgery at Cornell University Medical School, and Senior Visiting Surgeon of New York Hospital, will give a clinic for Boston University School of Medicine at the Boston City Hospital on Friday, October 20, 1933, between 11 A.M. and 12 Noon, in the Cheever Amphitheatre.

Subject: Thyroid Disease.

Physicians and medical students are cordially invited to attend the clinic.

OTTO J. HERMANN,
WILLIAM R. MORRISON,
DWIGHT O'HARA,
Committee on Clinics,
Boston City Hospital.

NEW ENGLAND PHYSICAL THERAPY SOCIETY

The first fall meeting of the New England Physical Therapy Society will be held in the Banquet Hall at the Hotel Victoria, 271 Dartmouth Street, Boston, at eight o'clock in the evening of Wednesday, October 18, 1933.

The meetings of this season will be conducted on the plan used so successfully last year. The Program Committee has arranged to have a different member of the Society take charge of each meeting. The October meeting has been assigned to Dr. William H. Watters who will present the paper of the evening.

PROGRAM

Ultraviolet Light. William H. Watters, M.D., Director, Boston-Miami Clinic.

Discussion will be opened by Franklin P. Lowry, M.D.

Dr. Watters has had extraordinary opportunities to study the therapeutic effects of ultraviolet light and his remarks will be of great interest and value.

The eminent Dr. A. de Borosini of Munich is visiting in Boston. It is expected that he will be present and will honor us with a discussion on colonic therapy for which he has devised a special apparatus and technic.

Council meeting at 6 P.M. Dinner at 6:30 P.M.

All members of the medical profession are cordially invited to attend.

ARTHUR H. RING, M.D., *Secretary.*

Arlington, Mass.

MIDDLESEX SOUTH DISTRICT MEDICAL SOCIETY

A meeting of the Middlesex South District will be held October 25, 1933, at 8 P.M. at the Hotel Continental, Cambridge.

Subject: "Function and Workings of the Workmen's Compensation Law."

Speakers: Joseph A. Parks, Chairman of Industrial Accident Board; Dr. Francis D. Donoghue, Medical Adviser to the Industrial Accident Board; Dr. Charles Mongan, Member of the Public Relations Committee.

ALEXANDER A. LEVI, M.D., *Secretary.*

MASSACHUSETTS PSYCHIATRIC SOCIETY

THE MASSACHUSETTS DISTRICT OF THE AMERICAN PSYCHIATRIC ASSOCIATION

The Annual Meeting of the Massachusetts Psychiatric Society will be held October 27 at 8:15 P.M. at the Hotel Somerset.

Professor Eugene Kahn of the Department of Psychiatry and Mental Hygiene of Yale University will be the guest speaker.

The title of his address will be "Organic Drivenness — A Brain-Stem Syndrome and an Experience."

OSCAR J. RAEDER, M.D., *Secretary.*

NEW ENGLAND HOSPITAL FOR WOMEN AND CHILDREN

The regular clinical conference of the New England Hospital for Women and Children will be held at the hospital, Dimock Street, Roxbury, on Thursday, October 19, at 8 P.M. The following cases will be presented: Lobar Pneumonia with Pulmonary Embolism; Spinal Arthritis with Toxemia of Thyroid Origin.

ALICE H. BIGELOW, M.D., *Secretary.*

THE NEW ENGLAND ROENTGEN RAY SOCIETY

The October Meeting will be held at the Massachusetts Memorial Hospitals, in the Evans Memorial, 82 East Concord Street, Boston, Friday, October 20, 1933, at 8:00 P.M.

The X-ray Department of the Evans Memorial will be open for inspection before the meeting and the apparatus described in Paper No. 6, and other features of interest, will be demonstrated.

SCIENTIFIC PROGRAM

1. Some Useful X-ray Accessories — Helen Matthews, M.S.
2. X-ray Features of Cranial Dysplasias of Pituitary Origin—Hector Mortimer, M.D.
3. A Simplified Apparatus for the Quantitative Measurement of X-rays — Richard J. Wagner, Ph.D.
4. Structural Relationships in Abnormal Individuals—Allan Winter Rowe, Ph.D.
5. Some Roentgenological Observations on Cholecystitis—Frank E. Wheatley, M.D.
6. Automatic-Control Apparatus for Predetermining the Phase of X-ray Exposure in the Cardiac Cycle (A Preliminary Report)—Samuel H. Caldwell, Sc.D.
7. Roentgenological Diagnosis of Coronary Disease—George Levene, M.D.

T. R. HEALY, M.D., *Secretary.*

INVITATION TO ATTEND A MEETING AT THE RING SANATORIUM

Dr. A. de Borosini of Munich, the eminent German authority on diet and elimination, will address a group of physicians on Tuesday evening, October 17, at eight o'clock at Hambury Hall, Ring Sanatorium and Hospital, Inc., 163 Hillside Avenue, Arlington Heights, Massachusetts. He will discuss colonic stimulation and will demonstrate his original technic and apparatus.

A buffet supper will be served.

Members of the profession interested in this subject are cordially invited to be present and to participate in the discussion.

HARVARD MEDICAL SOCIETY

The next meeting of the Harvard Medical Society will be held in the Peter Bent Brigham Amphitheatre (Van Dyke Street entrance), Tuesday evening, October 24, at 8:15 o'clock.

Presentation of Cases.

Subject: Experiences with High Temperatures at Boulder City, Nevada, with Some Clinical Applications. By Dr. D. B. Dill and Dr. Arlie V. Bock.

JOHN HOMANS, M.D., *Secretary.*

SOCIETY MEETINGS, CONGRESSES AND CONFERENCES

October 13—William Harvey Society will meet at 8 o'clock P.M., in the auditorium of the Beth Israel Hospital, Boston.

October 17—Invitation to attend a meeting at the Ring Sanatorium. See notice above.

October 16, 17, and 18—The Society of Plastic and Reconstructive Surgery will hold its annual meeting at the New York Academy of Medicine. Information may be obtained from the Secretary, Dr. Arthur Palmer, 667 Madison Avenue, New York City.

October 16, 17, 18—Massachusetts State Nurses' Association, Hotel Kimball, Springfield, Mass. For details write Helene G. Lee, R.N., 420 Boylston Street, Boston.

October 16—Ether Day will be celebrated at the Massachusetts General Hospital on Monday afternoon at 4:00 o'clock in the Moseley Memorial Building.

October 16-20—The International Assembly of the Inter-State Postgraduate Medical Association of North America will be held in the Public Auditorium, Cleveland, Ohio.

October 17—South End Medical Club will meet at noon at the headquarters of the Boston Tuberculosis Association, 554 Columbus Avenue, Boston.

October 18—New England Physical Therapy Society. See page 762.

October 19—Clinic at the Peter Bent Brigham Hospital. See page 761.

October 19—New England Medical Society. See page 762.

October 19—New England Hospital for Women and Children. See page 763.

October 20—The New England Roentgen Ray Society. See page 763.

October 20—Boston University School of Medicine, Clinical Meeting at the Boston City Hospital. See page 762.

October 21—Tri-City Meeting. See page 762.

October 23 - November 3—The 1933 Graduate Fortnight of the New York Academy of Medicine. The theme during the two weeks of intensive study will be Metabolic Disorders. A complete program may be obtained by writing Dr. Frederick P. Reynolds, The New York Academy of Medicine, 2 East 103rd Street, New York City.

October 24—Harvard Medical Society. See page 763.

October 25-30—International Congress on the Scientific and Social Contest Against Cancer will be held at Madrid. For information address Dr. Julio Bejarano, Atocha, 104. Madrid, Spain.

October 27—Massachusetts Psychiatric Society. See page 763.

October 28—The American Board of Dermatology and Syphilology will hold written examinations for candidates in the following cities: New York City; St. Louis, Mo.; Boston, Mass.; Cleveland, Ohio; San Francisco, Calif.; Philadelphia, Pa.; Chicago, Ill. Information may be obtained from the Secretary, Dr. C. Guy Lane, 416 Marlborough Street, Boston, Mass.

November 2 - June 7—A Series of Clinical Meetings at the Faulkner Hospital. See page 761.

December 15 and 16—The American Board of Dermatology and Syphilology will hold oral examinations in New York City. Information may be obtained from the Secretary, Dr. C. Guy Lane, 416 Marlborough Street, Boston, Mass.

April 16-20, 1934—The American College of Physicians will hold its Eighteenth Annual Clinical Session in Chicago at the Palmer House. For information write Mr. E. R. Loveland, Executive Secretary, 133-135 South 36th Street, Philadelphia, Pa.

July 24-31, 1934—The IVth International Congress of Radiology will be held in Zurich under the presidency of Professor H. R. Schniz. General Secretary Dr. H. E. Walther, Gloriastrasse 14, Zurich.

September 4, 5, 6, 1934—International Union Against Tuberculosis will be held in Warsaw. For particulars address The National Tuberculosis Association, 450 Seventh Avenue, New York, N. Y.

DISTRICT MEDICAL SOCIETIES

ESSEX NORTH DISTRICT MEDICAL SOCIETY

October 18—The next meeting of the Essex North District Medical Society will be at Andover Academy (Phillips Inn) on Wednesday, October 18, at 1 P.M.

Speakers:

Dr. W. H. Robey, President of the Massachusetts Medical Society.

Dr. Arthur W. Allen, "Pitfalls in Surgical Diagnosis."

Dr. B. H. Ragle, "Pitfalls of Medical Diagnosis."

E. S. BAGNALL, Secretary.

FRANKLIN DISTRICT MEDICAL SOCIETY

Meetings will be held on the second Tuesday of November, January, March and May at the Weldon Hotel, Greenfield, at 11 A.M.

CHARLES MOLINE, Secretary.

MIDDLESEX EAST DISTRICT MEDICAL SOCIETY

Schedule 1933-1934

Meetings will take place on November 8 at the Bear Hill Club, Stoneham; January 10 at Melrose; March (2nd Wednesday) at Wakefield, and May (2nd Wednesday) at Winchester.

ALLAN R. CUNNINGHAM, Secretary.
76 Church Street, Winchester, Mass.

MIDDLESEX NORTH DISTRICT MEDICAL SOCIETY

Meetings will be held on October 25, January 31, and April 25 (Annual Meeting).

T. A. STAMAS, Secretary.

MIDDLESEX SOUTH DISTRICT SOCIETY

October 25—See page 763.

NORFOLK DISTRICT MEDICAL SOCIETY

October 31—Stated Meeting, Hotel Kenmore, 8 P.M. Dr. H. J. Inglis.

November 28—Roxbury Masonic Temple, 8 P.M. Pneumonia Symposium, in charge of Dr. Frederick T. Lord.

January 28—Tentatively Roxbury Masonic Temple, 8 P.M. Continuance of Symposium on Diseases of the Blood. Dr. Dameshek and Dr. Straus.

February 27—Place, time, subject, and speaker to be announced.

March 27—Place and time to be announced. Dr. Edward A. Edwards and Dr. Henry H. Faxon. Symposium on the Treatment of Varicose Veins.

May—Annual Meeting. Place, time and program to be announced.

FRANK S. CRUICKSHANK, M.D., Secretary.

NORFOLK SOUTH DISTRICT MEDICAL SOCIETY

November 2—12 noon at Norfolk County Hospital. Stated Meeting. Speaker: Dr. Timothy Leary. Subject: Comparative Experimental Arteriosclerosis with Human Coronary Sclerosis.

December 7—12 noon at Quincy City Hospital. Program by the hospital staff.

January 4—12 noon at Norfolk County Hospital. Speaker to be announced.

February 1—12 noon at Norfolk County Hospital. Stated Meeting. Speaker: Dr. Sara Jordan. Subject: Stomach Ulcers.

March 1—12 noon at Quincy City Hospital. Program by the hospital staff.

April 5—12 noon at Norfolk County Hospital. Speaker: Dr. Elliott P. Joslin. Subject: Diabetes.

May 3—12 noon at Norfolk County Hospital. Annual Meeting. Election of Officers.

SUFFOLK DISTRICT MEDICAL SOCIETY

October 25—The first meeting of the Suffolk District Medical Society will be held on Wednesday, October 25, 1933, at the Boston Medical Library at 8:15 P.M. As a result of the questionnaire the Committee has made an especial effort and been fortunate enough to secure Dr. Oliver Hazard Perry Pepper of Philadelphia as the principal speaker. Dr. Pepper will speak on "Cerebral Hemorrhage and Thrombosis: The Importance of the Differential Diagnosis to Treatment and the Importance of Prevention."

Dr. Jacob H. Swartz of Boston will also address the Society. His subject will be "Fungus Infections of the Skin."

The Committee hopes that all members will attend this important meeting.

Be sure to reserve the date, Wednesday, October 25. Place: Boston Medical Library. Time: 8:15 P.M.

November 29—To be announced.

January 31—With Boston Medical Library and the Trudeau Society. Lawrason Brown, Principal speaker.

March 28—To be announced.

April 25—Annual Meeting.

WORCESTER DISTRICT MEDICAL SOCIETY

All meetings to be held on Wednesdays as follows:

November 8—Dinner and scientific program at the Grafton State Hospital, North Grafton, Mass.

December 13—Dinner and scientific program at St. Vincent Hospital, Worcester, Mass.

January 10—Dinner and scientific program at the Worcester City Hospital, Worcester, Mass.

February 14—Dinner and scientific program at the Worcester State Hospital, Worcester, Mass.

March 14—Dinner and scientific program at the Memorial Hospital, Worcester, Mass.

April 11—Open date.

May 9—Annual Meeting. Time and place to be announced later.

ERWIN C. MILLER, M.D., Secretary.